



RAJARAJESWARI COLLEGE OF ENGINEERING

MYSORE ROAD, RAMOHALLI CROSS

BANGALORE - 560074, KARNATAKA, INDIA

(An Autonomous Institution affiliated to VTU Belagavi, Approved by AICTE & GOK)

NAAC Accredited with 'A+' Grade, Accredited by NBA, ISO 9001:2015 Certified

International Conference

on

Recent Research in Computational Sciences & Engineering

(ICRRCE-2025)

(Theme : Electronics, Electrical, Computational & Basic Sciences)

*** Hybrid Mode ***

Proceedings of the

International Conference

(Scopus Indexed – Bentham Science)

Souvenir – Book of abstracts

12 April 2025

Organized by

Departments

of

Electrical & Electronics Engineering

Electronics & Communication Engineering

Computer Science & Engineering (IoT)

Computer Science & Design

Robotics & Automation

Basic Sciences & Engineering

(Physics, Chemistry, Mathematics & HSS)

Proceedings
of the
International Conference
I C R R C E - 2025

12 April 2025
Saturday

Souvenir

(Book of abstracts)

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Important Dates to Remember

Call for Papers	: 20 / 03 / 2025
Submission of Full-length papers	: 20 / 03 / 2025
Acceptance of Full-length papers	: 02 / 04 / 2025
Conference Registration	: 05 / 04 / 2025
Date of Conference / Keynote	: 12 / 04 / 2025
Valedictory Function / Best Paper / Poster & Prizes	: 12 / 04 / 2025

MESSAGE BY THE FOUNDER CHAIRMAN



Dr. A.C. Shanmugam, Chairman, RRG I

Dear Esteemed Delegates, Speakers, and Participants,

It is my great pleasure to welcome you to this conference, an exciting gathering of some of the brightest minds in the field of Technology. As a Founder Chairman, it is both an honor and a privilege to see this event come to fruition, bringing together professionals, innovators, and thought leaders to share knowledge, collaborate, and push the boundaries of what is possible in **“Computational Sciences & Engineering”**.

This conference has been designed with the goal of fostering insightful discussions, showcasing cutting-edge research, and providing opportunities for networking and collaboration. Our lineup of distinguished speakers and experts will undoubtedly inspire you, challenge your thinking, and provide valuable insights that will help shape the future of our industry.

This conference serves as a platform to not only learn but also to engage in meaningful conversations that drive change.

I encourage each of you to take full advantage of the opportunities this conference offers – to ask questions, exchange ideas, and make connections that will last well beyond the conference.

Thank you for your participation, and I wish you all a successful and rewarding conference.

MESSAGE BY THE PRESIDENT



Dr. A.C.S. Arun Kumar
President, RRGi

Dear All,

It is with great enthusiasm and honor that I welcome you to this Conference, a pivotal gathering that brings together brilliant minds from the fields of Computational Sciences and Engineering. As we embark on this exciting journey of discovery and collaboration, I am reminded of the power that computational technologies hold in transforming our world.

In today's rapidly evolving landscape, the intersection of computational methods and engineering solutions is more crucial than ever. From designing innovative materials to solving complex, real-world problems such as climate change, healthcare, and infrastructure, the potential of computational sciences to drive progress is boundless.

This conference provides a unique opportunity to delve into groundbreaking research, discuss emerging trends, and collaborate on shaping the future of computational sciences and engineering.

I would like to extend my deepest gratitude to all the organizers, volunteers, and sponsors who have made this conference possible. Your hard work and dedication have been invaluable in ensuring the success of this event.

MESSAGE BY THE EXECUTIVE DIRECTOR



Dr. S. Vijayanand
Executive Director, RRG

It is my distinct pleasure to welcome you all where innovation, collaboration, and technical excellence converge. As the Executive Director, I am truly excited to see so many bright minds from diverse disciplines coming together to explore the ever-evolving landscape of technology, engineering, and applied sciences.

In today's world, where technology is advancing at an unprecedented pace, the role of engineers, scientists, and technologists has never been more critical. From Biomedical Imaging, Robotics and Automation to Renewable Energy Sources, the topics covered in this conference are at the forefront of driving progress and making a lasting impact across industries.

Over the course of this event, we have the unique opportunity to learn, exchange ideas, and challenge the status quo.

I would like to extend my heartfelt gratitude to all the speakers, presenters, sponsors, and attendees for their commitment to making this conference a success.

Thank you for being part of this important event. I look forward to the exciting discussions and the innovations that will emerge from our shared efforts.

Wishing you an inspiring and productive conference!

MESSAGE BY THE SPECIAL OFFICER



Dr. S. Jeyabalan
Special Officer, RRGi

It gives me immense pleasure to extend my warm greetings to all the delegates, participants, and organizers of this prestigious conference. In an era driven by innovation, collaboration, and knowledge exchange, such academic and professional gatherings offer an exceptional platform to share ideas, showcase research, and build meaningful networks. This conference not only reflects our collective commitment to excellence but also symbolizes the vibrant intellectual spirit that propels progress across disciplines.

As the Special Officer, I commend the tireless efforts of the organizing committee and contributors who have meticulously planned and executed this event. I am confident that the discussions, deliberations, and presentations held during this conference will inspire new thoughts and contribute significantly to the respective fields of study. May this conference serve as a catalyst for future innovations and continued collaboration. I wish the event grand success and hope that all participants have a fruitful and enriching experience.

MESSAGE BY THE PRINCIPAL - RRCE



Dr. R. Balakrishna
Principal
RRCE

It gives me great pleasure to welcome you to the International Conference on Recent Research in Computational Sciences and Engineering (ICRRCE-2025). This Technical Conference will provide a prestigious platform by bringing together international technical researches and students to exchange their research knowledge and expertise issues relating to the dominating technology trends. Research activities across all the engineering fields pave the way for the industrial world to thrive forward with huge advancements. As an educational institution, encouragement and support to research can be provided by establishing a suitable platform for the research community, to interact with each other and to share the knowledge.

I wish all the participants a great conference and hope you all take back a lot of learning and inspiration.

MESSAGE BY THE CONFERENCE CONVENER



Dr. L. Rangaiah
Convener
ICRRCE-2025

I welcome the participants of the International Conference on Recent Research in Computational Sciences and Engineering (ICRRCE-2025). The main goal of organizing this conference is to share and enhance the knowledge of each and every individual in this world. We have given a good opportunity for those who have a thirst in knowing the present technological developments and also share their ideas. Furthermore, this conference will also facilitate the participants to expose and share various novel ideas. The conference aims to bridge the researchers working in academia and other professionals through research presentations and keynote addresses in current technological trends. It reflects the growing importance of intelligent Computing systems as a field of research and practice. You will get ample opportunities to widen your knowledge and network. I thank the conference committee for extending their valuable time in organizing the program and all the authors, reviewers, and other contributors for their sparkling efforts and their belief in the excellence of ICRRCE-2025.

MESSAGE BY THE PROGRAMME CHAIR

Dean Research (R & D)



Dr. T.C. Manjunath

Ph.D. (IIT Bombay), Fellow IETE,
Fellow IE Chartered Engineer,
Senior Member IEEE
Professor & Dean Research (R & D)
Dept. of CSE (IoT, CS, BCT), RRCE
Programme Chair, ICRRCE-2025

I, cordially welcome you all on behalf of organizing committee for the first International Conference on “*Recent Research in Computational Sciences & Engineering (ICRRCE-2025)*” being held on Saturday, the 12th of April 2025, which is being organized jointly by the Departments of ECE, EEE, CSD, CSE (IC), R & A, BSE (PCM HSS) of Rajarajeswari College of Engineering, Bengaluru, Karnataka, India. The conference is aimed at addressing the state-of-the-art multidisciplinary research needs and interdisciplinary aspects of electronics & its technological applications. Through the conference, we intend to share and exchange latest ideas and practical experience among Scientists, Researchers, Engineers, Medical Doctors, Faculty and Students from Electrical, Electrical & Computing Sciences Stream. The Conference is jointly organized with the emphasis being placed on new developments, applications and case studies related to emerging Science & Engineering Technologies and it provides a platform for convergence of ideas towards solving diverse real-world problems and gives an opportunity for people from diverse backgrounds to meet and discuss problems related to electrical engineering.

The information about the conference was largely sent through the Internet. However, the conventional postal method was also used. It was observed that a large no. of enquiries and a large number of papers have been received from all over the country. The Conference is one of the effective reflections of its scientific, academic, and social contribution. Not only does it allow us to meet, greet, and eat but it also provides a unique forum for exchange of ideas, offers, and opportunities. I invite all of you (academician / researchers / industry professionals / students/ sponsors and exhibitors) working in different areas of electronics engineering to participate in the event and make it a grand success.

I welcome all the participants and wish the event a grand success.

MESSAGE BY THE PROGRAMME CHAIR

Controller of Examinations



Dr. G. Sadashivappa
Controller of Examinations
RRCE

It is with great pride and pleasure that I extend my heartfelt congratulations to the organizers, participants, and contributors of this esteemed conference. Academic forums such as this serve as vital platforms for fostering innovation, critical thinking, and interdisciplinary collaboration. The compilation of abstracts and scholarly articles in this souvenir book is a testament to the intellectual curiosity and dedication of researchers and scholars who continue to push the boundaries of knowledge.

As the Controller of Examinations, I recognize the integral role that research and academic engagement play in enhancing the quality of higher education. This conference reflects a commendable effort to bridge theory and practice, providing a space for meaningful exchange of ideas and emerging perspectives. I wish all participants a successful and enlightening experience, and I hope the insights gained here will inspire continued excellence in both research and academic pursuits.

Message by the Co-Conveners

Dr. P. Ebby Darney, HoD, EEE, Dean- Student Affairs

Dr. Sunitha R, HOD, Dept. of ECE

Dr. Satheesha V, HOD, Dept. of R&A

Dr. A. S. Hari Prasad, HoD, Dept. of Mathematics

Dr. K. S. Krishna Kumar, HOD, Dept. of Physics

Dr. M. Selvi, HOD, Dept. of CSD

Dr Shashidhar V., HOD, Dept. of CSE (IC)

On behalf of the organizing committee of ICRRCE-2025, we extend my very warm welcome to all the participants. The primary objective of this conference is to provide a common platform for academicians, researchers & industry personnels, students (UG/PG/PhD) to exchange their ideas and work in some of the thrust areas of electronics & mechanical engineering. Special emphasis has been laid to encourage the students, staffs & research scholars to take up inter disciplinary work & publish papers in the conferences.

The convenient utilization of different materials in the active fields of electronics engineering technologies are well known. It is heartening to note that the various departments are conducting this event and providing a platform for the researchers from many parts of the country through this national conference in order to discuss the latest developments in the electronics stream, not to leave the allied circuit branches also such as the instrumentation, computer science, information science, telecommunications, medicine, etc... We are sure all the participants will be immensely benefitted by this event from the Bentham Science Publication banner of the RRCE.

We congratulate all the UG/PG/PhD students and the team of professionals, the members of the event who have worked hard in organizing this event and inspire them to continue this kind of effort in the future days to come. The successful convene of this ICRRCE is a combined result of the strong support of our committee members and the hardworking teams. Again, all the work we put in has only one purpose, which is for you to have a great conference here. So, enjoy the conference & your stay in Bangalore.

Message by the Technical Programme Committee

Dr. J. Amutharaj, Prof., CSE, Dean - Administration
Dr. S. Jagannathan, Prof., AIML, Dean - Corporate Affairs
Dr. Karthikeyan M, Prof., R & A, Deputy COE
Dr. Ramesh C, Prof., R & A, Dean - Infrastructure
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Prof. Shivalingaiah K L, Asst. Professor of EEE
Prof. Sincy Elezebeth K, Asst. Professor of EEE
Dr. Lokanadham. M, Asst. Prof. Mathematics
Dr. Raveendra N, Asst. Prof. of Mathematics
Prof. Avinash C M, Asst. Professor of EEE

We heartily welcome all the delegates, participants and guests to the International Conference (ICRRCE-2025) on various themes in engineering sector. The main motive of this conference is to provide all the researchers, industrialists, Student members from all over the state and academia a common platform on a global level to share their ideas with each other & at the same time to motivate all the undergraduate & post graduate students to write & publish papers. We are confident that at the end of this conference, a great knowledge base will be created for inhouse students, faculties & research scholars.

We hope you will enjoy the all the sessions in this international conference and the interactions with your colleagues and other presenters here. The conference will prove beneficial and also will increase the innovative spirit in all of you. Let us look forward to a brilliant conference.

We wish all the presenters all the best and we hope you will have a great time here, at the same time, we wish the proceedings of the conference a great success.

Message by the Publication Chair

Dr. Sudhakara A, Prof. & HOD, Dept. of Chemistry

Dr. Jobish Johns, Physics, Assoc. Dean - R & D

Dr. Thanuj Kumar M, R & A Dept., Assoc. Dean-Student Affairs

We heartily welcome all the delegates, participants and guests to the International Conference and is immensely happy to learn that the departments of ECE EEE R&A CSD CSE(IC) BSE of RRCE is conducting this 1-day national conference on 12 Apr 2025 and also happy that a souvenir is being brought to commemorate this occasion.

This conference is in accomplishment of the beginning of the 20-year of the inception of the College, i.e., in the year 2006 when the College branch was started.

The rich experience and knowledge of the experts from across our country and the world will be shared during the conference. The conference day will feature multiple presentation sessions from the students of the undergraduate & the post-graduate course.

This event will provide a wonderful opportunity for the research scholars also to present their research activities.

We convey my best wishes for the success of the international conference.

Message by the Organizing Committee Members

Dr. Pruthvi Raj RD, Assoc. Prof. Chemistry
Dr. ArulJose R, Assoc. Prof. of EEE
Prof. Lokesha K, Asst. Professor of ECE
Prof. Nandini N, Asst. Prof. of EEE
Dr. Anitha B S, Asst. Prof. Mathematics
Prof. Haritha KS, Asst. Professor, ECE
Prof. Vani S Badiger, Asst. Prof., ECE
Dr. Sumitha Manoj, Assoc. Prof., ECE
Prof. V Sreepathi, Asst. Professor, ECE
Prof. Santosh Chavan, Asst. Prof., ECE
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Prof. Dhananjay B. S. Asst. Prof. of R&A
Prof. Rubithra A, Asst. Prof. of CSD
Prof. Kumari D N, Asst. Professor, ECE
Prof. Daneshwari Modi, Asst. Prof, ECE

It is our great pleasure to welcome you to the International Conference on Recent Research in Computational Sciences & Engineering (ICRRCE-2025) which takes place in the beautiful garden city of Bangalore. It has been a real honor and privilege to serve as one of the conveners of the conference.

The ICRRCE conference is going to establish as a good reference for the dissemination of high-quality research in all aspects of computational sciences and networking, and for fostering interaction and exchange of ideas.

We convey our best wishes for the success of the national conference which is being done in the RRCE dept. We are grateful to all authors who trusted us with their work; without them there would be no conference.

The conference proposes to bring together experts, researchers, planners, administrators, users, practitioners, teachers, students as well as leaders of industry to interact, exchange new ideas, discuss new developments and look at the challenges ahead in the field of mechanical engineering.

We wish best of lucks to all the people of the conference who are attending & presenting their papers, interact with others and carry a rich memories back.

Conference Objectives

The International Conference on “**Recent Research in Computational Sciences & Engg.**” (ICRRCE-2025) is a international event and is aimed to address the various state of the art multidisciplinary research needs & interdisciplinary aspects of **Electronics & Communication Engg, Electrical & Electronics Engg, Computer Sciences & Engg in IoT, Computer Science & Design, Robotics-Automation, Basic Sciences & Engg** in the form of research papers especially from the **Undergraduate Students UG-BE/BTech, Post-Graduate Students (ME/MTech/MCA/MBA), Research Scholars pursuing PhD programme & Diploma Students** from different colleges, the theme of the event being **Computational Sciences & Engineering**.

Conference Proceedings

Accepted, registered and presented papers will be published in Bentham Science Publications which is indexed by Scopus and Web of Science, once the publication gets completed, the indexing takes place as per the scopus regulations of around 1 year. All Accepted and Presented Papers will be published in Bentham Science Publications which is done Indexing by Scopus and Web of Science.

<https://benthambooks.com/future-series-by-subject/computer-andinformation-science/sub-category/computing/>

Topics : of interest for submission include - (but are not limited to)

- Topics in Basic Sciences (Phy, Chem, Maths) Engg.
- IoT Architecture and Design, Industrial IoT (IIoT)
- Industry 4.0
- Healthcare applications of Io T, Agriculture
- Environmental monitoring using IoT
- 5G and its impact on IoT, Satellite communication for IoT, IoT Protocols & Data Analytics and Machine Learning in IoT
- IoT device authentication and authorization, IoT in Emerging Technologies : Microwaves & Antennas
- VLSI Design & Embedded Systems, Microcontroller
- Analog, Digital, Nano & Medical Electronics
- Digital Image, Signal & Video Processing
- Artificial Intelligence, Robotics & Automation
- AI, ML, DL, Cloud Computing & Data analytics
- Adv. topics on Comp. Sci. & Info. Sci. Engg.
- Adv. topics on Telecom & Electrical Engg
- Signal, Image & Video Processing
- Mobile/Wireless Communications
- Renewable Energy Sources
- Soft Computing Techniques
- Biomedical and Health Informatics
- Fuzzy control and their applications

- Artificial Intelligence & Machine
- Learning
- Ad hoc/Sensor Networks
- Biomedical Imaging
- Internet Of Things (IOT)
- Low power VLSI
- Robotics and Automation
- Cryptography & Cyber Security
- Emerging Frontiers in Nanomaterials
- and Nanotechnology
- Polymers and Soft Matter Innovations
- Materials for Next-Generation
- Electronics and Photonics

Call for research papers :

ICRRCE-2025 invites original research articles from Academicians, Research Scholars, scientists and Engineers working with Private / Public organizations / Industries under any of the tracks listed below. All papers must pass through plagiarism test as per the Journal norms. Prospective authors are invited to submit full length original research papers as per conference / journal format to the ICRRCE-2025.

Submit Your Papers to: icrrce@rrce.org

Delegate to the Conference Registration Fees

UG / PG Students : Rs. 7000 / USD 85

Research Scholar/ Academician/ Industry Person : Rs. 8000 / USD 95

(Conference Kit, Lunch and publication charges with souvenir).

The registration fee must be deposit to given account through NEFT/IMPS.

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 	International Conference on Recent Research in Computational Sciences & Engineering (ICRRCE - 2025) - Hybrid Mode 12 April 2025, Saturday RAJARAJESWARI COLLEGE OF ENGINEERING BANGALORE-74, KARNATAKA, INDIA [Organized by the Departments of ECE, EEE, CSD, CSE(IC), R&A, Basic Sciences]	

Conference Registration Form

Name of the Participant / Delegate / Author / Guide who is doing registration per paper	:	
Designation : Student / Staff / Research Scholar / Industry Person	:	
Qualification of the participant (Diploma/UG/PG/PhD/PDF)	:	
Name of the institution where currently working	:	
Place of working	:	
Paper Id	:	
Hybrid mode of presentation (on-line / off-line)	:	
Title of the paper	:	
Names of all the authors	:	
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Phone No. (Whatsapp) – 3 / Email Id	:	
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Phone No. (Whatsapp) – 5 / Email Id	:	
Phone No. (Whatsapp) – 6 / Email Id	:	
Participants need to pay the registration fees using the bank details → 	:	UG / PG Students : Rs. 7000/- PhD Students / Faculties / Industry : Rs. 8000/- a/c Holder Name : RajaRajeswari College of Engineering Branch Name : ICICI Bank Bank Branch : Kumbalgodu Branch, Bangalore-74 Account Number : 263701000032 IFSC Code : ICIC0002637 UPI ID : 9606046445@icici
Registration Fee Details	:	
Phone-Pe / Paytm / Google Pay / Bank Transfer IMPS NEFT RTGS (tick whichever applicable)	:	
Payment Id No. (Transaction ID/UTR, ...)	:	
Place of payment done	:	
Bank & Branch where paid	:	
Amount paid	:	
Date of payment done	:	
Snapshot of the payment made with full details	:	
Signature of the registered participant	:	

A sample copy of the conference registration form

About RRCE

RajaRajeswari College of Engineering (RRCE), established in the year 2006 under the shelter of Moogambigai Charitable and Educational Trust. The sole objective for starting institutions of higher education of exemplary stature in the State of Karnataka. RRCE is became an Autonomous Institution under VTU, Belagavi and Approved by UGC, New Delhi and Govt. of Karnataka. Accredited By NBA, NAAC with 'A+' Grade & International Accreditation by HLACT, Texas, UK. The Institution offers 12 UG courses [33ECE, CSE, ISE, EEE, AI&ML, Robotics & Automation, Mechanical, Civil, CSE (IC), CSD, B.Sc. (Hons), BCA (Hons) and BBA (Hons)] and 3 PG courses, Master of Technology in Computer Science & Engineering, Master of Business Administration & Master of Computer Applications and also 9 R&D centers.

Moogambigai Charitable and Educational Trust (Regd) was founded by the Chairman Dr. A. C. Shanmugam, B.A. LLB, FIMSA, FRCPS (Glasgow, UK) former M.P and MLA in the year 1992, in order to provide quality professional education at affordable cost to deserving students irrespective of their caste creed or religion. The trust established 8 Institutions of excellence at Bangalore and RajaRajeswari College of Engineering is one among them.

RajaRajeswari College of Engineering came into existence in 2006 with the objective of becoming a centre of excellence in technical education. In less than a decade it has carved a reputation for itself as an institution that makes a positive difference in the lives of its students.

Located off the Bangalore – Mysore highway, the college campus is a space devoted to offering the very best in terms of learning. The college is approved by the AICTE – New Delhi, affiliated to VTU, Belagavi and Govt. of Karnataka. Accredited By NBA (CSE, ECE, ISE), NAAC with 'A+' Grade& International Accreditation by HLACT, Texas, UK.

It offers Under Graduate programs in nine engineering disciplines, besides masters programs. Departments such as Artificial Intelligence & Machine Learning, Civil Engineering, Computer Science Engineering, CSE (IoT and Cyber Security including Blockchain Technology), Electronics and Communication Engineering, Electrical and Electronics Engineering, Information Science and Engineering, Mechanical Engineering, Robotics and Automation and three PG courses Computer Science and Engineering, Master of Business Administration, and Master of Computer Applications, also nine Research Centres.

The RajaRajeswari College of Engineering campus has been designed as a complete. Self-contained centre of excellence with modern classrooms, state-of-the-art labs, workshops, library, hostels, Wi-Fi enabled campus with high-speed internet connectivity and advanced computing facilities. A 1000-seater auditorium, 400-seater conference hall and 6 seminar halls of 120 capacity each are regular venues for conferences, seminars and other events. A dedicated and highly qualified faculty has authored books and regularly publishes papers, with students too being encouraged to participate in the research process.

Website : <https://www.rrce.org/>

Vision of the Institute

To empower young minds through technology, research, and innovation, to produce technically competent and socially responsible professionals in higher education.

Mission of the Institute

1. To deliver excellence in education through innovative teaching, impactful research, and continuous skill development, preparing students to meet global challenges with technical expertise and ethical responsibility.
2. To foster a transformative learning environment that integrates technology, research, and practical experience, empowering students to become skilled professionals and socially conscious leaders.
3. To cultivate a culture of lifelong learning and professional excellence by encouraging creativity, research, and community engagement, equipping students with the skills to thrive in a dynamic world
4. To provide a holistic educational experience that combines advanced technology, hands-on research, and community-focused learning, shaping students into competent, ethical professionals who contribute positively to society.

Sister Colleges under Rajarajeswari Group of Institutions RRG I

1. RajaRajeswari Medical College & Hospital
2. Chamundeshwari Medical College & Hospital
3. RajaRajeswari Dental College & Hospital
4. ACS College of Engineering
5. RajaRajeswari School/College of Nursing
6. RajaRajeswari College of Physiotherapy
7. RajaRajeswari Institute of Allied Health Sciences
8. **Rajarajeswari College of Engineering**

Branches in Rajarajeswari College of Engineering, Bangalore
--

1. B.E in Robotics and Automation
2. B.E in Artificial Intelligence and Machine Learning
3. B.E in Civil Engineering
4. B.E. in Computer Science and Engineering
5. B.E. in Computer Science and Design
6. B.E. in Computer Science and Engineering (IoT and Cyber Security Including Blockchain Technology)
7. B.E. in Electrical and Electronics Engineering
8. B.E. in Electronics and Communication Engineering
9. B.E. in Information Science and Engineering
10. Bachelor of Computer Applications (BCA)
11. Bachelor of Business Administration (BBA)
12. B.Sc. (Honors)
13. Master of Business Administration (MBA)
14. Master of Computer Applications (MCA)
15. M.Tech. in Computer Science & Engineering
16. Ph D – Civil Engineering
17. Ph D – Computer Science & Engineering
18. Ph D – Management Studies
19. Ph D – Mathematics
20. Ph D – Mechanical Engineering
21. Ph.D – Chemistry
22. Ph.D – Physics
23. Ph.D – Electronics and Communication Engineering
24. Ph.D – Electrical and Electronics Engineering

International Conference on Recent Research in Computational Sciences & Engineering

ICRRCE - 2025

Departments of EEE ECE CSD CSE (IC) R&A BSE (PCMB HSS)

Rajarajeswari College of Engineering, Bangalore, Karnataka

12 / 4 / 2025

International Conference Report

The International Conference on Recent Research in Computational Sciences & Engineering (RRCE-2025) was held on 12th of April 2025 in the hybrid mode, i.e., both on-line & in the off-line mode and the event was a good success. The conference was launched in the month of Nov'2025. A series of meetings were conducted in the beginning to see to it that the conference will be a big success. Various committees like stage committee, registration committee, screening committee, session committee, prize distribution committee, hospitality committee, Steering Committee, Program Committee, Advisory Committee, Organizing Committee, Publicity and Promotion Committee, Finance Committee, Technical, Publication Committee, Local Arrangements Committee, Social Events Committee, Student Activities Committee, Volunteer Committee, Evaluation Committee, feedback committee, MC, Sponsorship Committee, Exhibition Committee, Cultural Committee, Social networking & marketing committee, etc were constituted with various faculty members of the participating departments. All the committee members worked very hard for 6 months to see to it that the conference was a big success. The stages of development were checked in the frequent meetings every month. Brochures, Invitations, Registration Templates, Certificate Designs, Formats for abstract, manuscripts, were designed by the committee members. The brochures were sent both in hard copy as well in soft copies to all the places across the country in post & email.

A total of **514** papers from all over the country were received by the conference mail-id. All the papers were reviewed by reviewers from various organizations & industry people. Authors were asked to submit the abstracts. Once the abstracts were accepted, the authors were asked to submit a full-length paper with <25% plagiarism. A plagiarism test (drill bit/turntin) was also conducted for the received papers by the screening committee. Those papers which were having more than 25% plagiarism was straight away rejected. It was found that many papers belonged to this category, i.e., **60** papers. The rest of the **514** papers, i.e., around **454** papers were scrutinized, sent to various places for reviews and the review reports were received. It was found that out of the **454** papers, nearly **190** papers were straight away rejected by the reviewers as there was no contents & substance in the paper and papers were of poor quality, cut and paste, taken from Chat GPT. The rest of the **264** accepted papers were communicated to all the authors and were asked to do the registration by paying the requisite registration fees of **Rs. 7000 / Rs. 8000**. Out of the **264** accepted papers, **214** authors registered by paying the requisite registration fees of Rs. 7000 / Rs. 8000. The authors were asked to send the final manuscript with the incorporation of the reviewer comments in the conference template given by the Bentham Science Publications, the duly filled up conference registration form & the payment receipt along with the revised abstract, the copyright form given by the Benth Science Publications. Registered papers were received from various states of the country like Tamil Nadu, Andhra Pradesh, Uttar Pradesh, Karnataka, etc... & few of them from the International Arena like Russia, Gulf, etc...

List of committee & its members who worked for the event

The following members worked for the event

Brochure Preparation & Invitation Committee

Chaithanya S, Suresh M, Avinash CM

Social media promotion

Dr. Radhakrishna PK, Sincy K Elizabeth, Shwetha, Meenakshi

Registration & Reception Committee

Dr. Thanuj Kumar M, Nandini N, Haritha KS, Archana, Bhavana, Manasa G, Bhavana HV, Rubithra, Rathiraj TR, Ashwitha, Ramya

Editorial Committee

Dr. T.C. Manjunath, Dr. Sudhakara A, Dr. Jobish John, Dr. Thanuj Kumar M.

Stage Decoration Committee

Dr. Krishna Kumar KS, Dr. Deepika J, Vani SB, Prutha G, Renuka, Ashwitha, Shashidhar, Dhananjaya

Food Committee

Dr. Ramesh, Sreepathi V., Shivalingaiah KL, Dr. Srinivasulu Reddy N, Ramesha S, Chandru BV, Ravikumar SK, Ghouse Pasha

Transport Coordinator

Ramesha S., Ajay M

Technical Committee

Dr. Ebby Darney, Dr. Shashidhar V, Santosh Chavan, Lokesha K, Dr. Arul Jose, Dr. Vishwanath KC, Dr. Ravindra N, Dr. M. Selvi, Manohar TV, Pruthviraj, Savitha B., Dr. Muruganandham A.

Finance Committee

Dr. Sunitha R, Dr. Anitha, Dhaneswari Modi

Sponsorship Committee & Discipline

Dr. Sunitha R, Dr. Ebby Darney, Dr. Satheesha V., Dr. Shashidhar V., Dr. Selvi M., Dr. A.S. Hariprasad

The detailed report on the flow of the conference activities

1. Morning Session: Registration and Inauguration

The conference began with the registration process between 8:30 AM and 10:00 AM on the second floor of the venue, ensuring a smooth check-in for participants and dignitaries. This was followed by the inaugural ceremony at 10:00 AM, hosted at the Dr. APJ Abdul Kalam Conference Hall, which set the stage for the day's intellectual engagements. Distinguished guests including Mr. David Ocema (Chief Guest), Shri M. Sesha Sai (Guest of Honour), and Dr. Lawrence Jenkins (Distinguished Guest) graced the occasion along with the Principal Dr. R. Balakrishna, Convener Dr. L. Rangaiah & Dr. T.C.Manjunath, the Dean (R & D).

Key segments of the inauguration included the lighting of the lamp, welcome address, conference overview, speeches by dignitaries, and the release of the ICRRCE-2025 proceedings, symbolizing the academic essence of the event. The inauguration concluded with a keynote address by Shri M. Sesha Sai, who spoke on the topic "*Global Opportunities for Interdisciplinary Research*", emphasizing international collaborations and innovation-driven initiatives.

2. Midday Break

Post-keynote, a high tea session from 11:45 AM to 12:00 PM allowed participants to relax, interact, and prepare for the technical paper presentation sessions.

3. Afternoon Technical Sessions (12:00 PM - 4:00 PM)

The conference hosted ten parallel technical sessions—both offline and online—across various seminar halls. These sessions spanned across topics like Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), Deep Learning (DL), Networking (N/W), Neural Networks (NN), Mathematics, Chemistry, Biomedical Engineering, Robotics, and Communication Engineering.

1. **Session 1 (AI & ML - Offline):** Held at the Dr. APJ Kalam Hall, chaired by Dr. Naveen N and Dr. Rajesh K S
2. **Session 2 (IoT & DL - Offline):** Took place in the EEE Seminar Hall with Dr. Shivakumarswamy P. M. and Dr. Satheesha V as chairs.
3. **Session 3 (N/W, NN, CHE, MATH - Offline):** Conducted in the R&A Seminar Hall, chaired by Dr. Ajina and Dr. Sudhakara A.
4. **Session 4 (ML - Online):** Streamed via Google Meet and hosted in the ISE Smart Classroom, chaired by Dr. B. Ravi Chandra and Dr. Kirubha D.
5. **Session 5 (IoT - Online):** Managed from the ECE Seminar Hall, chaired by Dr. Manjunath Reddy H. S. and Dr. C. S. Pillai.
6. **Session 6 (AI - Online):** Held in the ECE Smart Classroom, with Dr. A. Veji Fernando and Dr. Sreenivas Murthy V as chairs.
7. **Session 7 (DL, ML, AI - Online):** Organized in the CSE Seminar Hall, chaired by Dr. Pramodkumar S. Kataraki and Dr. K. S. Krishna Kumar.

8. **Session 8 (N/W & IoT - Online):** Conducted from the CSE Smart Classroom, led by Dr. Sadashiva Chakrasali and Dr. Raveendra N.
9. **Session 9 (Image Processing & Biomedical - Online):** Took place in the MCA Seminar Hall, chaired by Dr. I. Jeena Jacob and Dr. Jobish Johns.
10. **Session 10 (Robotics, ECE, EEE, NN, CC - Online):** Held in the MBA Seminar Hall with chairs Mr. C. Lokanath Reddy and Dr. Sunitha R.

Each session featured rigorous presentations, peer reviews, and interactive discussions, contributing to a fruitful knowledge-sharing environment.

4. Conclusion: Tea Break & Valedictory

After an intense series of paper presentations in the on-line / virtual mode in the g-meet, a tea break was scheduled from 4:00 PM to 4:15 PM, offering a moment of relaxation and informal networking. This was followed by a Valedictory Program at 4:15 PM, formally marking the conclusion of the day's events. The session likely included a summary of key proceedings, recognitions for outstanding presentations, and acknowledgments to organizing teams and participants. Best papers are also going to be announced in the valedictory function.

5. Overall Summary

The ICRRCE-2025 was a well-structured and comprehensive academic conference that successfully blended offline and online platforms to cater to a wide range of research areas in computational sciences and engineering. With enthusiastic participation from researchers, academicians, and international dignitaries, the event served as a vibrant platform for exchanging ideas, showcasing research, and fostering future collaborations.

Conference Stats

No. of papers received from all over the country to ICRRCE : **514**

No. of papers rejected due to high plagiarism contents : **60**

No. of papers rejected by the paper reviewers by the reviewing team : **190**

No. of papers accepted overall : **264**

No. of papers registered by paying registration fees : **214**

No. of not registered papers : **50**

Acceptance ratio : **50 % (Refereed)**



RajaRajeswari College of Engineering

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)
#14, Ramohalli, Kumbalaguda, Mysuru Road, Bengaluru-560074





Dr. A.C. Shanmugam
B.A., LL.B., FIMA, FICPI (Singapore, UK)
Founder Chairman, RRG1

The Management, Board of Members, Staff and Students Are Cordially Invited To

**International Conference on Recent Research in
Computational Sciences & Engineering (ICRRCE-2025)**

Jointly Organized By:
**ECE, EEE, CSD, CSE (IC), R & A
and Basic Sciences**



Sri. A.C.S Arun Kumar
B.Tech (Hons), LMITE, MPT, JUCE, IMCS,
President, RRG1



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Chief Guest
Mr. David Ocema
Lecturer, Islamic University
Uganda



Guest of Honour
Shri. M. Sessa Sai
Honorary Consul General
Republic of Seychelles



Distinguished Guest
Dr. Lawrence Jenkins
Distinguished Professor
IISc, Bengaluru

Date: 12th April 2025 Time: 10.00 AM Venue: Dr. Abdul Kalam Hall

Dr. S. Vijayanand., M. Tech, Ph.D.
Executive Director, RRG1

Dr. A.K. Mariappan
Rector, RRCE

Sri. C.N. Seetharam., I.A.S. (Retd.)
Chief Executive Officer, RRG1

Dr. Rangaiah L.
Dean Academics

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Dr. Balakrishna R
Principal

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CHIEF GUEST

Mr. David Ocema
Lecturer, Islamic University
Uganda



GUEST OF HONOUR

Shri. M. Seshu Sai
Honorary Consul General
Republic of Seychelles



DISTINGUISHED GUEST

Dr. Lawrence Jenkins
Distinguished Professor
IISc, Bengaluru

Jointly Organizing by

ECE, EEE, CSD, CSE (IC), R & A AND BASIC SCIENCES

DATE - 12.04.2025 TIME - 10 : 00 A.M.

VENUE

Dr. 

ABDUL KALAM CONFERENCE HALL

Dr. S. Vijayanand, M.Tech., Ph.D
Executive Director, RRG

Dr. S. Jeyabalan., Ph.D
Special Officer, RRG

Sri. C N Seetharaman, IAS, (Retd.)
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**No. 14, Ramohalli Cross, Kumbalagodu,
Mysore Road, Bangalore**

Invitation



RAJARAJESWARI COLLEGE OF ENGINEERING

(An Autonomous Institution Under Visvesvaraya Technological University, Belagavi)

International Conference on Recent Research in Computational Sciences and Engineering (ICRRCE-2025)

12th April 2025

10.00AM	: Welcoming the Guests on the dais
Chief Guest	: Mr. David Ocema, Lecturer, Islamic University, Uganda
Guest of Honour	: Shri. M. Sessa Sai, Honorary Consul General, Republic of Seychelles
Distinguished Guest	: Dr. Lawrence Jenkins, Distinguished Professor, IISc, Bengaluru
Principal	: Dr. R. Balakrishna
Convener	: Dr. L. Rangaiah
Dean R&D	: Dr. T. C. Manjunath
Bentham Science	: Dr. Senthamil Selvan
HoDs of ECE, EEE, R&A, CSE (IC), CSD and Basic Sciences	
10.02AM	: State Anthem
10.05AM	: Invocation Song by Students: Ms. Anagha & Team
10.10AM	: Lighting of the Lamp by Dignitaries
10.13AM	: Welcome Address by Dr. Ebby Darney, Professor, Dept. of EEE
10.17AM	: About the ICRRCE-2025 by Dr. L. Rangaiah, Convener, ICRRCE-2025
10.20AM	: Presidential address by Dr. R. Balakrishna, Principal
10.25AM	: Address by Dr. T C Manjunath, Dean – R&D
10.30AM	: <i>Felicitations to Chief Guest, Guest of Honor & Distinguished Guest</i>
10.33AM	: Introduction of the Distinguished Guest by Prof. Haritha K S
10.35AM	: Address by Distinguished Guest: Dr. Lawrence Jenkins, IISc
10.45AM	: Introduction of the Chief Guest by Dr. Deepika J
10.47AM	: Address by Chief Guest: Mr. David Ocema, Lecturer, Islamic University, Uganda
<i>Releasing the Proceedings of the Conference ICRRCE-2025</i>	
10:57AM	: Introduction of the Guest of Honor by Prof. Manasa G V Kumar
11.00AM	: Key note Address Shri. M. Sessa Sai, Honorary Consul General, Republic of SEYCHELLES
11.30AM	: Vote of Thanks by Dr. J Amutharaj, Dean-Administration
11.35AM	: National Anthem
11.37AM	: Photo Session
11.40AM	: Tea Break

Programme flow of events

The conference schedule details a structured flow of events for the International Conference on Recent Research in Computational Sciences and Engineering, set to take place on 12th of April 2025.

The event starts at 10:00 AM with a welcoming of the guests on the dais, setting a formal and courteous tone for the day. The Chief Guest for the conference is Mr. David Ocema from Islamic University, Uganda, and the Guest of Honor is Shri M. Sesha Sai, the Honorary Consul General from the Republic of Seychelles. Additionally, Dr. Lawrence Jenkins, a Distinguished Professor from IISc, Bengaluru, is also a distinguished guest.

Following the introductions and welcome remarks, the event continues with the state anthem and an invocation song performed by students, adding a cultural and solemn touch to the proceedings. A significant ceremonial aspect follows with the lighting of the lamp by dignitaries, symbolizing enlightenment and the pursuit of knowledge.

Dr. L. Rangaiah, the convener of the conference, then delivers a welcome address, which sets the academic tone and context for the conference. This is followed by an overview of the event provided by the Dean of R&D, Dr. T. C. Manjunath, and then addresses by various dignitaries, including the Principal, Dr. R. Balakrishna and the guests on the dais. These speeches likely highlight the conference's themes, importance, and the expectations.

Next, there will be a formal release of the conference proceedings souvenir book of abstracts, marking a pivotal academic contribution of the conference. This is followed by a keynote address from Shri M. Sesha Sai, offering insights and expert knowledge, further enriching the intellectual atmosphere of the event.

The event progresses towards a vote of thanks by Dr. J. Amutharaj, which is a customary closure to the formal part of the morning session, expressing gratitude towards all contributors and participants. The national anthem is played again, reflecting the formal and patriotic closure to this segment, followed by a photo session and a tea break, providing attendees with an opportunity to network and discuss the morning's presentations and speeches informally.

Sample copy of the conference brochure



Rajarajeswari College of Engineering

(An Autonomous Institution Under Visvesvaraya Technological University, Belagavi)

Sponsored by: MOOGAMBIGAI CHARITABLE AND EDUCATIONAL TRUST



International Conference on Recent Research in Computational Sciences & Engineering
(ICRRCE-2025) organized on 12th April 2025

SCHEDULE OF EVENTS

Day 1: 12th April 2025

08:30-10.00 AM	Registration		Venue: Second Floor
10.00-11.00 AM	Inauguration		Venue: Dr. APJ Kalam Conference Hall (Second Floor)
11:00-11:45 AM	Keynote Address by, Shri. M. Sesha Sai Honorary Consul General, Republic of Seychelles		Topic: "Global Opportunities for Interdisciplinary Research" Venue: Dr. APJ Kalam Conference Hall (Second Floor)
11.45- 12.00 PM	HIGH TEA		
12:00-04:00 PM	SESSION 1: AI & ML (OFFLINE) Venue : Dr. APJ Kalam Hall (2 nd Floor) Staff In-charge Prof. Manohar T V	PAPER ID ICRRCE-022, 033, 069, 079, 080, 089, 091, 099, 113, 139, 148, 154, 159, 165, 183	SESSION CHAIR Dr. Naveen N BGSIT, BG Nagara Dr. Rajesh K S RRCE, Bangalore
	SESSION 2: IoT, DL (OFFLINE) Venue : EEE Seminar Hall (1 st Floor) Staff In-charge Dr. R Arul Jose	PAPER ID ICRRCE-044, 095, 107, 168, 181, 210, 221, 241, 248, 229, 249, 231, 076, 078	SESSION CHAIR Dr. Shivakumarswamy P.M. JSSATE, Bangalore Dr. Srinivasulu Reddy RRCE, Bangalore
12:00-04:00 PM	SESSION 3: N/W, NN, CHE, MATH (OFFLINE) Venue : R&A Seminar Hall (1 st Floor) Staff In-charge Dr. Vishvanath K C	PAPER ID ICRRCE-082, 090, 093, 098, 155, 176, 179, 191, 211, 244, 250, 252, 262, 263	SESSION CHAIR Dr. Ajina MSRIT, Bangalore Dr. Sudhakara A RRCE, Bangalore
12:00-04:00 PM	SESSION 4: ML (ONLINE) Venue : ISE Smart Class Room (2 nd Floor) Staff In-charge Dr. Pruthviraj R D	PAPER ID ICRRCE-015, 021, 023, 024, 029, 030, 034, 042, 046, 072, 119, 126, 129, 135, 144, 151, 156, 175, 182, 201	SESSION CHAIR Dr. B Ravi Chandra G Pullaiah College of Engg & Technology, Kurnool Dr. Kirubha D RRCE, Bangalore
		Google Meet Link ICRRCE-2025_SESSION-4 Saturday, April 12 - 11:30am - 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/mzb-vbcm-pmd	
12:00-04:00 PM	SESSION 5: IoT (ONLINE) Venue : ECE Seminar Hall	PAPER ID ICRRCE-002, 008, 009, 027, 041, 053, 054, 057, 061, 067, 070, 073, 074, 084, 087, 092, 102, 106, 114, 118	SESSION CHAIR Dr. Manjunath Reddy H S

Campus: #14, Ramohalli Cross, Kumbalgodu, Mysore Road, Bengaluru - 560074

Phone: +91-80-28437124 / 28437375

Website: <https://www.rrce.org>



Rajarajeswari College of Engineering

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	(4 th Floor) Staff In-charge Prof. Santosh Chavan	Google Meet Link ICRRCE-2025_SESSION-5 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/lxsg-qwzg-rvc	DBIT, Bangalore Dr. C S Pillia RRCE, Bangalore
12:00-04:00 PM	SESSION 6: AI (ONLINE) Venue: ECE Smart Class Room (4th Floor) Staff In-charge Prof. Lokesha K	PAPER ID ICRRCE-005, 017, 075, 076, 108, 110, 124, 127, 134, 136, 137, 140, 141, 160, 187, 188, 196, 203, 208, 213, 215 Google Meet Link ICRRCE-2025_SESSION-6 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/orp-jaej-cat	SESSION CHAIR Dr. A Veji Fernando Dayananda Sagar University, Harohalli Dr. Sreenivas Murthy V RRCE, Bangalore
12:00-04:00 PM	SESSION 7: DL, ML, AI (ONLINE) Venue: CSE Seminar Hall (5th Floor) Staff In-charge Dr. Savitha B	PAPER ID ICRRCE-016, 052, 059, 064, 083, 101, 122, 150, 171, 172, 180, 214, 216, 223, 225, 243, 256, 258, 242, 251 Google Meet Link ICRRCE-2025_SESSION-7 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/sqlk-gksh-zdg	SESSION CHAIR Dr. Pramodkumar S Kataraki Reva University, Bangalore Dr.K.S.Krishna Kumar RRCE, Bangalore
12:00-04:00 PM	SESSION 8: N/W, IoT (ONLINE) Venue: CSE Smart Class Room (5th Floor) Staff In-charge Dr. Raveendra N	PAPER ID ICRRCE-012, 048, 066, 068, 103, 128, 138, 143, 145, 167, 169, 178, 222, 233, 239, 162, 173, 174, 206, 226 Google Meet Link ICRRCE-2025_SESSION-8 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/bzh-hzee-pzx	SESSION CHAIR Dr. Sadashiva Chakrasali MSRIT, Bangalore Dr. Raveendra N RRCE, Bangalore
12:00-04:00 PM	SESSION 9: Image Processing, Bio Medical (ONLINE) Venue: MCA Seminar Hall (6th Floor) Staff In-charge Prof. Sasikumar B	PAPER ID ICRRCE-013, 035, 043, 062, 063, 071, 088, 094, 096, 111, 132, 164, 170, 185, 189, 190, 209, 212, 228, 230, 232, 237, 246 Google Meet Link ICRRCE-2025_SESSION-9 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link:	SESSION CHAIR Dr. I Jeena Jacob Gitam University, Bangalore Dr. Jobish Johns RRCE, Bangalore

Campus: #14, Ramohalli Cross, Kumbalgodu, Mysore Road, Bengaluru – 560074

Phone: +91-80-28437124 / 28437375

Website: <https://www.rrce.org>



Rajarajeswari College of Engineering
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		https://meet.google.com/cxd-parh-gpm	
12:00-04:00 PM	SESSION 10: ROBOTICS, ECE, EEE, NN, CC (ONLINE) <i>Venue: MBA Seminar Hall</i> <i>(6th Floor)</i> Staff In-charge Prof. Deeraj C	PAPER ID ICRRCE-049, 056, 060, 125, 149, 195, 200, 051, 058, 065, 097, 117, 198, 086, 123, 131, 157, 261, 032, 193, 224, 192, 264 Google Meet Link ICRRCE-2025_SESSION-10 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/rev-skhk-dri	SESSION CHAIR Mr. C Lokanath Reddy G Pullaiah College of Engg & Technology, Kurnool Dr. Sunitha R RRCE, Bangalore
12:00-04:00 PM	SESSION 11: (ONLINE) <i>Venue: Board Room</i> <i>(Ground Floor)</i> Staff In-charge Dr. Selvi M	PAPER ID ICRRCE-011, 047, 081, 100, 105, 112, 130, 142, 147, 158, 177, 194, 218, 219, 227, 235, 240, 257, 260, 245, 255, 207, 234, 247 Google Meet Link ICRRCE-2025_SESSION 11 Saturday, April 12 · 11:30am – 4:00pm Time zone: Asia/Kolkata Google Meet joining info Video call link: https://meet.google.com/vcr-rnxd-qqw	SESSION CHAIR Dr. Anandkumar K S Atria Institute of Technology Dr. Selvi M RRCE, Bangalore
04.00-04.15 PM	TEA BREAK		
04.15-04.30 PM	Valedictory Program		

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Sample copy of the sessions schedule (online & offline)



RECENT RESEARCH IN COMPUTATIONAL SCIENCES AND ENGINEERING (ICRRCE-2025)
ON
RAJARAJESWARI COLLEGE OF ENGINEERING
Organized by
12th APRIL, 2025

1. Brochure Preparation & Invitation Committee: Co-Ordinators : Prof. Chaithanya S

Sl. No	Faculty Name	Dept.	Mobile No	Responsibilities
1.	Prof. Chaithanya S	ECE	9900403554	1. Brochure and Invitation Preparation
2.	Prof. Suresh M	ECE	9482467932	2. Sending brochure and invitations to the colleges and participants
3.	Prof. Avinash C M	EEE	9740369481	3. Sending invitation to the chief patrons, patrons, Chief Guest, Guest of honor, Session Chairs and HODs.

2. Social Media promotion: Co-ordinator:

Sl. No	Faculty Name	Dept.	Mobile No	Responsibilities
1.	Dr. Radhakrishna R K	R&A	9611333833	1. Collect posters and upload in social media and our website
2.	Prof. Sincy K	EEE	9886246348	2. Pre and post event report submission and publication in media.
3.	Prof. Shwetha	EEE	8431602037	3. Collecting messages from Chairman, Vice-Chairman, Executive Director, Special Officer, Principal, Convener to print in the Proceedings and handover to editorial committee.

3. Registration and Reception Committee: Co-Ordinator: Dr. Thanuj Kumar M

SL No	Faculty Name	Dept.	Mobile No	Responsibilities
1.	Prof. Nandini N	EEE	7204501818	1. Preparing Registration form and Program Schedule
2.	Prof. Haritha. K S	ECE	9113011127	2. Collection Registration details from editorial committee
3.	Prof. Archana	Maths	8971083017	3. Preparing Feedback form and collecting feedback from participants, Session chairs
4.	Prof. Bhavana		7090939903	4. Collect the certificates (Best paper, Participation, Session Chairs) from invitation committee and writing the names
5.	Prof. Manasa G	R&A	8553010990	
6.	Prof. Bhavana H V	CSE(IC)	9886720021	
7.	Prof. Rubithra	CSD	8807735585	
8.	Prof. Rathiraj T R	Chemistry	9741675739	
9.	Prof. Ashwitha	Physics	9164405845	
10.	Prof. Ramya	EEE	9740996632	

4. Editorial Committee: Co-Ordinators: Dr. Manjunath T C

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2.	Dr. Jobish John	Physics	9481514492	3. Sending Acceptance, Registration details to the authors and preparing Google form to get the registration details. 4. Sending the papers to reviewers
3.	Dr. Thanuj Kumar M	R&A	9964653644	5. Collecting the camera ready papers from authors and send to publisher.

5. Stage Decoration Committee: Co-Ordinator: Dr. Krishna Kumar K S & Dr. Deepika J

Sl. No	Faculty Name	Dept.	Mobile No	Responsibilities
1.	Prof. Vani S B	ECE	9916393828	1. Inauguration: Stage Decoration (Banners, water bottles, Lamp), PA system at A P J Abdul Kalam Hall. Identifying the students for Anchoring & Prayer song. 2. Display AV about the college 3. Valedictory function at APJ Abdul Kalam Hall. Distribution of Certificates and Awards.
2.	Prof. Pruthi. G	EEE	9036663802	
3.	Prof. Renuka	CSE(IC)	9482019201	
4.	Prof. Ashwitha	Physics	9164405845	
5.	Prof. Shashidhar	Physics	6362484606	
6.	Prof. Dananjaya	R & A		

Food Committee Co-ordinator: Dr. Ramesh C and Prof. Sreepathi V

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2.	Dr. Srinivasulu Reddy N	R & A	9964653644	
3.	Prof. Ramesha S	Chemistry	8105766855	
4.	Prof. Chandru B V	H & S	9740962546	
5.	Prof. Ravikumar S K	H & S	9740805538	
6.	Prof. Gouse Pasha	CSE(IC)	6362680057	

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.	Prof. Ajay M	ECE	9945022075	1. Call to the guests and finding the pickup / drop locations 2. Arranging the vehicles 3. Parking : Guests and participants

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2.	Prof. Lokesh K		9845744692	
3.	Dr. Arul Jose	EEE	9443835956	
4.	Dr. Vishwanath K C	R&A	9900449906	
5.	Dr. Ravindra N	H & S	9886414320	
6.	Dr. M Selvi	CSD	7619154417	
7.	Prof. Manohar T V	CSE(IC)	8919557725	
8.	Prof. Pruthviraj	Chemistry	9742832678	
9.	Dr. Savitha B	Maths	9742009245	
10.	Dr. Muruganandham A	ECE	9620776688	

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2.	Dr. Anitha	ECE	9900218000	
3.	Prof. Daneswari	ECE	9611306757	

10. Sponsorship committee & Discipline: Dr. Sathesha

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4.	Dr. Shashidhar V	CSE(IC)	9538231393	
5.	Dr. Selvi M	CSD	7619154417	
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 Ramohalli Cross, Bengaluru-74

Dr. T.C. Manjunath
 Dean Research (R&D)
 RRCE, Bangalore - 74

Some of the colleges from where research papers were received

1. RNS Institute of Technology, Bangalore, Karnataka.
2. Nagarjuna College of Engineering and Technology, Bangalore, Karnataka.
3. Sir M Visvesvaraya Institute of Technology, Bangalore, Karnataka.
4. BMS Institute of Technology & Management, Bangalore, Karnataka.
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37. GITAM School of Technology, Chickballapur, Karnataka
38. GITAM (Deemed to be University), Bengaluru, Karnataka, India
39. Jyothy Institute of Technology, Bangalore, Karnataka.
40. DFTTI, Theni, Tamilnadu
41. Gulf
42. Soviet Union

**List
of
Accepted &
Registered Paper
Abstracts to the
ICRRCE-2025
12 Apr 2025**

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Paper No. ICRRCE – 002

Internet of Things Based Assistive Technology with Fall Detection for Elderly Care

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Abstract—The major objective of this research work is to understand the importance of elderly care with the help of Internet of Things. The significance of the usage of technology in the Healthcare and the elderly care is studied and implemented in this work. The primary objective of this study resulted with significant improvement and performance in the proposed methodology when compared with the state-of-the-art techniques. The experiment is carried out as the proof of concept in the real time environment and the results are observed.

Keywords—Elderly Care, IoT, Assistive Technology Sensor

Paper No. Paper No. ICRRCE-005

AI-Driven OS Security Systems and Edge OS

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Abstract – Securing operating systems (OS) and edge computing environments has become increasingly challenging with the rise of Artificial Intelligence (AI) and the widespread adoption of Internet of Things (IoT) devices. Traditional security paradigms often fail to address the dynamic, distributed nature of edge computing systems. AI-driven security systems have emerged as a promising solution, utilizing advanced techniques such as predictive analytics, real-time monitoring, and intelligent automation to adapt to and mitigate evolving threats. These AI-powered security frameworks significantly enhance the security posture of both conventional and edge operating systems by integrating innovative approaches, including federated learning, decentralized threat intelligence, and lightweight AI models optimized for resource-constrained environments. This paper explores the latest advancements in AI-driven OS security systems, with a focus on how AI is transforming the security landscape. It discusses the critical challenges facing AI-based security in OS environments, such as resource limitations, data privacy concerns, adversarial attacks, and latency in real-time threat detection. The paper highlights emerging AI solutions, including hardware-level security measures, AI-enhanced anomaly detection, and scalable, adaptive Defense mechanisms that can be applied to both OS and edge systems. By examining current methodologies, this work emphasizes AI's transformative role in securing the periphery of edge computing environments, such as edge servers and IoT nodes. Furthermore, it outlines future research directions, focusing on integrating quantum-resistant algorithms, adaptive learning techniques, and cross-domain security models to build resilient, scalable, and efficient security architectures for AI-driven OS security systems.

Keywords – Artificial Intelligence, Internet of Things, Edge Computing, Micro AI, Malware Detection

Paper No. ICRRCE-008

Building Smart Campus IoT Solutions For Surveillance And Visitors Guidance

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Abstract— This project focuses on designing and implementing smart campus solutions using IoT technology to enhance surveillance and visitor guidance. The system integrates IoT-enabled sensors, cameras, and location-based services to provide real-time monitoring and automated visitor assistance. Key features include intelligent surveillance for security, dynamic wayfinding for navigation, and centralized data management for operational efficiency. By leveraging IoT, the solution ensures seamless communication between devices and fosters a safer, more connected campus environment. The project demonstrates how IoT can transform traditional campuses into intelligent, adaptive ecosystems, offering insights into scalable and sustainable implementation strategies. This proposes an IoT-driven smart campus system featuring advanced surveillance cameras and interactive display systems by using c++ programming language. The solution ensures seamless visitor navigation, offering real-time guidance and navigation access through intelligent displays. Additionally, the system integrates secure data storage for monitoring and analysis. The expected outcome is a streamlined, user-friendly campus experience, enhancing safety and operational efficiency.

Keywords - Visitor Guidance, Surveillance, Real-Time Monitoring, IOT (Internet of things), Seamless Navigation.

Paper No. ICRRCE-011

Microfinance for Empowerment: An Examination of Effective Self-Help Group Projects in Northern Tamil Nadu

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Abstract - The empowerment of rural communities through microfinance initiatives has become a cornerstone of development strategies in India. In line with this, the current study aims to investigate the impact of microfinance on members of Self-Help Groups (SHGs) in selected northern districts of Tamil Nadu. Microfinance facilitated primarily through SHGs, has emerged as a potent instrument for economic empowerment and poverty alleviation in rural regions. By providing access to financial services such as credit, savings, and insurance, microfinance empowers individuals to engage in income-generating activities, thereby fostering economic self-sufficiency and resilience within communities. This chapter seeks to delve into the socio-economic effects of microfinance on SHG members, exploring how access to financial resources and support networks has influenced their livelihoods, standard of living, and overall well-being. Through a comprehensive analysis, we aim to uncover the nuanced ways in which microfinance initiatives have contributed to the empowerment and socio economic advancement of SHG members in the targeted districts of Tamil Nadu.

Paper No. ICRRCE-012

A comprehensive review on fault tolerances , routing techniques and energy efficiency in network on chip architectures

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Abstract –All our modern processors are all belong to multicore processors. A new category of processors, where multiple processing units are housed on a single chip. According to Jordan Moore predicted that the number of transistors inside a chip is going to double every eighteen months. The advances in VLSI Innovations have brought out the Network-on-Chip (NoC) as an essential solution to handle the network communication issues in complex multi-core systems. Meanwhile, NoC's is a flexible and efficient solution for data communication within multi-core microprocessors as the complexity of semiconductor technology grows. This survey paper makes a comprehensive analysis of the innovation, problem and application conduct that has been made by NoC's in multi-core systems. The paper starts with a background from where the focus is shifted to modern multi-core processors along with the significance of NoC's in improving the inter-core connectivity. For one, it makes a comprehensive survey of NoC design parameters or strategies for topologies, routing algorithms, and protocols and unveils the extent of the influence of NoC designs on the performance and scalability effect of the NoC. It also summarises the key limitations of NoC implementation that includes power management, reliability, and congestion control. Other important matters concerning the use and utilization of bandwidth and the issue of latency is also addressed as well provided us to squeeze in more number of transistors inside a chip. Package density of transistors has increased very high. More number of transistors inside chip permits us to include more number of functional units like processors, memory, control unit etc inside a chip. In the era of "Internet of Things and IOT and Artificial Intelligence and there is a requirement to collect and process huge data, and many of the applications are in real time, which demands high computation power, a massive parallel computer. To address these challenges, the paper offers solutions as follows, which are the new design strategies, energy efficient and fault tolerant schemes which endeavour to improve on the overall performance of NoC as a design topology in large scale multiple core processing. As is presented, potential uses of NoC's are identified in a number of novel application areas such as high-performance computing, IoT and artificial intelligence, demonstrating that NoC architectures maintain and enhance their relevance. Last, the paper discusses future work, and presents more details on why NoC's have to be adaptive, self-organizing structures, which will be sufficient for supporting multi-core systems of the next generation. NoC is a promising technology for multi core systems and this survey serves as a good starting point for researchers, engineers and technologists in this field.

Keywords –NOC, Routing Algorithm, power efficiency, fault tolerance, memory management, Network-on-Chip, multi-core systems, routing algorithms, energy efficiency, fault tolerance

Paper No. ICRRCE-013

Navigating Organizational Change in the Disruptive Era: A Bibliometric perspective

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Abstract - Organizational change has become an important field of study in management and Organizational behaviour due to constant changes and requirement for adapting to the continuously shifting environment. This study provides insights into the major concepts, significant authors, fundamental works, and developing research topics in the subject of Organizational change through a bibliometric analysis of the literature. Using a large dataset of academic publications from reliable academic database named Scopus, this analysis maps the intellectual structure and development of the Organizational change literature using bibliometric tools such as co-citation analysis, keyword analysis, and author analysis. This study adds to a better understanding of the complex field of Organizational change research by synthesizing and visualizing the interconnected network of research themes, theoretical frameworks, and empirical investigations. The bibliometric analysis's conclusions have significant significance for academics, professionals, and decision-makers who want to understand and participate in the current conversation around Organizational change management.

Keywords: Bibliometric analysis, Change management, Organizational change

Paper No. ICRRCE-015

Chronic Disease Prediction Using Machine Learning With Data Preprocessing Handling

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Abstract— Early prevention is essential for many chronic disorders, such as diabetes mellitus, stroke, cancer, heart disease, renal failure, and hypertension, according to the World Health Organization (WHO). A preventive strategy Machine can be used is a prediction of learning -based chronic illness A person's medical history or conclusions Regular exam. Standard prediction is the target Reduce the prognosis error as much as possible. Two most There are important factors for prediction of chronic diseases Data quality and machine suffer as a machine Learning technique. Five main issues that reduce data Quality equipment, lack of price, selection of comforts, Generalization and imbalance. Once we have ensured that Data is of excellent quality, we can choose the best machine Ways to learn. When the most important item to consider. The choice of a prophet is accuracy, recall, accurate and F1 scores. Therefore, increase performance and solve problems medical data is the goals of prediction of chronic illness. It Project Systematic Literature Review (SLR) provides a Extensive review of research on the use of machine learning for the prediction and handling of chronic diseases Data preaching. Deep education, learning reinforcement, there is some of the monitored learning and clothing learning Machine learning methods involved in this project. We cover Pre -treatment to deal with concerns as lack of values, Outlair, functional choice, generalization, and imbalance.

Keywords— Systematic Literature Review (SLR)

Paper No. ICRRCE-016

A Novel Hybrid Deep Learning Framework for Alzheimer's Disease Early Diagnosis

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Abstract – Alzheimer's disease (AD) classification through the application of deep learning models, specifically Convolutional Neural Networks (CNNs), to improve diagnostic accuracy across different stages of the disease. Using a diverse dataset obtained from open-access repositories, the study categorizes subjects into four stages of AD: Mild Demented, Moderate Demented, Non- Demented, and Very Mild Demented. These stages represent varying degrees of cognitive decline, which are crucial for the diagnosis and monitoring of Alzheimer's progression. The primary goal of the research is to evaluate and compare the performance of two distinct deep learning models in diagnosing AD at different stages. The CNN model, known for its strong performance in image classification tasks, will be fine-tuned to optimize its accuracy in this specific application. Fine-tuning involves adjusting the model's architecture and hyperparameters to ensure it performs effectively on the AD classification task. Through this comparative analysis, the study seeks to determine the most effective deep learning approach for Alzheimer's classification, which can aid in early detection and intervention. By identifying the model that provides the most accurate predictions, the research aims to contribute to the development of more reliable diagnostic tools for Alzheimer's disease.

Keywords – Alzheimer's disease, (CNNs), Image Classification, MRI, Deep Learning.

Paper No. ICRRCE-017

Road Vision : An efficient Artificial Intelligent powered Damage Detection

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Abstract – This work is primarily focused on identification of the damage in the road and proposing the suitable solution by using the effective deep learning method and the incorporation of Artificial Intelligence. The YOLO methodology is used with the computer vision and the effective performance of the system is observed. The effective usage of Deep Learning methods with the Computer Vision combined gives a most computationally effective solution in terms of performance and accuracy. The Accuracy is obtained 98% which is considerably improved with the other methods available in the literature.

Keywords –Damage Control, Deep Learning, YOLO.

ICRRCE-021

Medicine Overdose Prediction Using Machine Learning

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Abstract - Predicting drug overdoses is critical to improving patient safety and preventing fatal outcomes in healthcare systems. The potential of machine learning (ML) techniques to predict drug overdoses using various clinical data sources. The model uses algorithms such as decision trees, support vector machines, and neural networks to identify patterns and risk factors associated with overdose incidents. We train and validate the model using a dataset containing patient demographics, prescription details, and medical history, and evaluate it using precision, precision, recall, and F1 score. Results demonstrate that the machine learning model can effectively predict overdose risk and provide valuable decision support to healthcare professionals. This study highlights the importance of early intervention and individualized treatment strategies to reduce overdoses.

Paper No. ICRRCE-022

Stock Price Prediction Using Machine Learning

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Abstract - Stock value forecast is a perplexing and dynamic field of monetary exploration that means to foresee future stock costs in light of verifiable and ongoing information. This study examines the utilization of AI procedures to foresee stock costs successfully. Customary measurable techniques frequently experience issues managing the high unpredictability and nonlinear examples innate in monetary business sectors. AI, which can perceive complex examples and connections, offers a strong other option. This study utilizes regulated learning calculations, for example, direct relapse, support vector machines (SVM), group techniques, for example, arbitrary woods and inclination helping, and profound learning approaches like repetitive brain organizations (RNN) and long transient memory organizations (LSTM) to show and gauge stock cost developments. Include designing is utilized to coordinate specialized pointers, opinion investigation from monetary news, and macroeconomic variables to work on the exactness of the prescient model. Results show that AI models, particularly profound learning procedures, outflank conventional techniques in catching nonlinear examples and time conditions in stock cost information. The concentrate likewise addresses difficulties, for example, overfitting, information commotion, and common sense by coordinating methods like cross-approval, regularization, and hyper boundary tuning. This study features the capability of AI in monetary business sectors, giving financial backers, examiners, and monetary foundations with the bits of knowledge they need to pursue information driven choices. Future examination bearings incorporate coordinating more different information sources, ongoing prescient abilities, and investigating support learning for portfolio improvement.

Keywords - Stock cost forecast, AI, profound learning, LSTM, Monetary examination, Time information

Paper No. ICRRCE-023

Exploring Machine Learning Models for Deep-Fake Detection and Classification

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Abstract –The primary work done in this research is the identification of the Deep Fake content in the Social Media. The incorporation of Machine Learning and the advanced Deep Learning models have attained significant results in identifying the false content. The details of the observations done were also presented. The performance of the proposed system is compared with the methods in the literature. This paper introduces a deepfake detection system using convolutional neural networks (CNNs) for feature extraction and classification. The technique includes preprocessing input data, deep visual feature extraction, classifier layer definition, and performance optimization by verifying the loss function. The system is evaluated through extensive experiments, which provide high accuracy and reliability to identify synthetic media from authentic content.

Keywords –Deep-Fake, Training, Machine Learning

Paper No. ICRRCE-024

Intrusion Detection System Using Machine Learning

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Abstract—Network foundation assaults are right now the most genuine dangers to arrange and data security. Since standard firewall procedures can't give absolute security against interruption, notwithstanding persistently rising criminal operations in networks, interruption discovery (ID) as a part of protection inside and out is turning out to be progressively significant. The most popular method for identifying events occurring in a PC system or network and decomposing them for interruption warnings is the interruption location framework. To determine an exact model for the interruption recognition framework, this research employs a variety of approaches, including the Xgboost methodology, Random Forest algorithm, and Decision tree methodology. In the comparison between decision trees, random forests, and decision trees and random forests with AdaBoost, the suggested models had more incredible accuracy.

Keywords - Intrusion detection, cyber-attacks, Random Forest Classification, XgBoost, AdaBoost, CatBoost, Decision- Tree, Gradient Boosting, BernoulliRBM, Multi-Layer Perceptron, Linear Discriminant Analysis, Quadratic Discriminant Analysis, Support Vector Classification, hybrid algorithms.

Paper No. ICRRCE-027

Smart Railway Monitoring System (Real-Time Platform Availability, Track Crack Detection, Fire Safety, and Creature Detection Using AI and IoT)

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Abstract –The Railway Track Tracer System for identifying problems on railway tracks is a new automatic system that is meant to detect cracks and avoid accidents on the tracks. The system scans the tracks round the clock with a camera, and it is simple to detect cracks and take action to prevent possible catastrophes. The Internet of Things (IoT) is a research buzzword, and its uses are almost limitless. Here, IoT is utilized to offer real-time updates on the management of railway. An IR sensor is utilized to verify the availability of platforms to ensure the subsequent train receives an update of the platform condition in order to avert accidents. The system also detects fire hazards and provides automatic engine withdrawal, updating the platform information in real time. With an increase in railway accidents, which are frequently the result of track-related issues such as misalignment, obstructions, or cracks, handling these issues may be very difficult for one person. That's why we've created an IoT-based Railway Inspection System with a sensor-equipped robot car. This robot is capable of identifying potential hazards on the tracks, utilizing different sensors such as tilt, ultrasonic, infrared, water, and fire sensors, with movement regulated by a relay. In this project, we developed a train track security and monitoring program that enables us to monitor the railway tracks with an automated robot. The robot moves along the tracks, checking their condition for bends and damages. We run this bot from a remote location, getting all the information via an Android app, allowing us to monitor faults in the tracks in real-time. Based on this information, we can successfully avoid problems such as accidents and train derailment due to faulty tracks.

Keywords –Rail surface defect detection, YOLOv8, object detection, computer vision, automated inspection, Arduino UNO, small target detection.

Paper No. ICRRCE-029

Crop disease prediction using machine learning

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Abstract –Agriculture plays an important role in economy as it considered to be a backbone of economic system for the developing country. Crop diseases significantly impact agricultural productivity, causing challenges in food security and farmers livelihood. So, to prevent this we need to timely detect it and predict the crop disease that can help in reducing crop damage and improve crop management. This study explores the use of machine learning to predict crop diseases based on images provided. The implementation involves pre-processing the image data provided to enhance accuracy, feature extraction for identifying the disease pattern, and model optimization to improve prediction performance. The proposed approach involves training a model using large amount of dataset to ensure it can detect diseases correctly of a single crop. This system aims to support farmers in making important and informed decision, so that it results in improving agricultural outcomes and reduces the dependency on traditional methods which consumes more time and which might not be accurate enough.

Keywords – Machine-learning, image processing, Convolutional neural network (CNN), Deep-Learning.

Paper No. ICRRCE-030

Segmentation and Detection of Covid-19 in X-Ray Images Using Particle Swarm Optimization

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Abstract - The COVID-19 epidemic highlights the necessity for accurate and effective virus identification to prevent its spread. Using Imaging studies of the chest are necessary in order to determine the need for adequate dividing up the affected area. This work proposes a segmentation using COVID-19 X-rays technique applied through the use of Particle Swarm Optimization (PSO). The approach required pre-processed X-ray images with Discrete Wavelet Transform (DWT) and segmenting contaminated areas using PSO. The segmented images were effectively tested for correctness. Our data show that the proposed technique effectively segments the area that is affected, demonstrating it's the possibility of using to diagnose COVID-19. This research aids in the creation of effective and precise Screening for COVID-19 methods, which fall under crucial for halting the disease transmission.

Keywords - Coronavirus, Medical imaging, Particle Swarm Optimization, Discrete Wavelet Transform

Paper No. ICRRCE-032

Fortifying Data and Infrastructure Security in the Cloud: Strategies and Best Practices

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Abstract - The primary objective of this research work is to enhance the security of the cloud infrastructure as well as the data stored in the cloud environment. The enhanced DNA codec-based encryption is proposed in the system to ensure the data security and the infrastructure is secured by adjusting the additional security features and thereby enhancing the state-of-the-art methods. The results obtained by the proposed methodology is observed to be computationally improved that the state-of-the-art techniques.

Keywords - security, encryption, DNA codec, cloud service

Paper No. ICRRCE-033

Multi-modal Emotion Recognition Using Neural Networks

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Abstract – The emotion recognition system has gained significant attention across various fields, such as psychology, human-computer interaction, and artificial intelligence. This paper consists of a multimodal emotion recognition system that integrates neural networks. It analyzes both audio and visual data in real-time video streams. The proposed system adopts advanced feature extraction techniques like librosa for preprocessing audio signals and multilayer perceptron (MLP) classifiers, which have been trained on the RAVDESS dataset. In addition, a facial recognition model has been integrated to enhance the emotion recognition system. The system facilitates cloud-based deployment, such as Ngrok. It highlights the system's efficacy in analyzing the emotion through multiple modalities. This research pioneered robust emotion recognition frameworks, contributing to mental health assessment and human-computer interactions.

Keywords – Emotion analysis, speech recognition, MLP Classifier, neural networks, facial recognition, Ngrok platform, multi-modal, cloud deployment, feature extraction, RAVDESS dataset

Paper No. ICRRCE-034

Fraud Detection on Online Shopping using Machine Learning Techniques

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Abstract - The volume of internet users is increasingly causing transactions on e-commerce to increase as well. We observe the quantity of fraud on online transaction is increasing too, machine learning used as a decision tree algorithm, naïve Bayes, neural networks, and Logistic Regression. The rise of e-commerce transactions has led to an increased risk of fraudulent activities such as identity theft, unauthorized access, and payment fraud. we aim to safeguard our consumer interests and foster a safer online marketplace environment. Moving forward, continued research and development in this area will be essential to further refine and optimize our proactive technique for benefit of all stakeholders involved.

Keywords - Decision tree algorithm, naïve Bayes, neural networks, and Logistic Regression

Paper No. ICRRCE-035

Fetal Brain Abnormalities

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Abstract –The This research addresses the critical need for early detection and classification of fetal brain abnormalities via the use of deep learning, through the implementation of the You Only Look Once (YOLO) architecture. The proposed architecture combines YOLO's real-time object detection ability for recognition and classification of single abnormalities in foetal brain images obtained via state-of-the-art imaging modalities. Capitalizing on the strength of deep learning, our system is designed to automatically detect anomalies such as ventriculomegaly, corpus callosum agenesis, and other congenital abnormalities. The YOLO-based approach not only streamlines the process of detection but also enhances accuracy and efficiency in the classification of anomalies, enabling early medical care and guidance for parents. Besides, the paper takes detection and classification a step further through the use of a novel segmentation technique that precisely stamps the diseased areas in the foetal brain. Through the integration of the latest image segmentation techniques, the model presents detailed maps with noted areas that match the areas of detected abnormalities. The segmentation helps in improving the readability of the output of the diagnosis, aiding in the development of effective targeted intervention strategies for healthcare workers. The integration of YOLO-based detection, classification, and segmentation enables the demonstration of the ability of deep learning in reforming the inspection of foetal brain abnormality, rendering the solution comprehensive yet cost-effective to apply for early diagnosis and clinical decision-making.

Keywords – Fetal brain abnormality detection, You Only Look Once (YOLO) architecture, Deep learning/YOLO, Image segmentation.

Paper No. ICRRCE – 041

Smart POS and Restaurant Management System : Streamlining Operations for Efficiency

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Abstract – The primary objective of this manuscript is to develop a POS and Restaurant Management System. The requirements are gathered at the real time and based on that a complete application is developed. The system was developed and tested in the runtime environment and the deployment is done. The performance of the system is computationally good in terms of request processing and memory and time management.

Keywords – web application, POS, full-stack development

Paper No. ICRRCE-042

Biometric Watermarking Using ML and Deep Learning Approach

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Abstract - In a generation where record safety is paramount, this paper affords a complete biometric watermarking solution that enhances document authentication through the fusion of iris and fingerprint snapshots. utilizing the advanced Encryption standard (AES) algorithm, the proposed machine guarantees the cozy encryption of biometric statistics, developing a robust virtual watermark. This watermark is then embedded in documents to offer an additional layer of safety against unauthorized get admission to and forgery. A Convolutional Neural community (CNN) is hired for authenticating the biometric watermark, correctly distinguishing among true and counterfeit biometric capabilities. furthermore, the gadget includes actual-time notifications and an adaptive learning mechanism, making sure continuous improvement and responsiveness to rising protection threats. with the aid of integrating these superior technologies, the proposed system offers a scalable solution for securing sensitive files and improving trust in virtual transactions

Keywords – biometric watermark, AES, CNN

Paper ID : ICRRCE-043

Deciphering emotions integrating enhanced textual and vocal sentiment analysis

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Abstract –The ability to accurately interpret and respond to human emotions is a critical component of advanced artificial intelligence systems. This study aims to enhance sentiment analysis by integrating textual and vocal data, thereby improving the accuracy and depth of emotion detection. Traditional sentiment analysis methods primarily focus on text, often overlooking the rich emotional cues present in-vocal expressions. By combining textual sentiment analysis with vocal sentiment analysis, this research seeks to create a more holistic understanding of user emotions. We utilize advanced natural language processing (NLP) techniques and machine learning algorithms to analyze textual data, extracting sentiment and emotional nuances from written content. Concurrently, we apply sophisticated audio processing and deep learning models to interpret vocal data, identifying tonal variations, pitch, and speech patterns that convey emotional states. Our integrated approach involves the development of a hybrid model that synthesizes findings from both textual and vocal analyses, leading to a comprehensive sentiment profile. The model performance is evaluated using a diverse dataset comprising various textual and vocal inputs to ensure robustness and generalizability across different contexts and languages. The results demonstrate significant improvements in emotion detection accuracy compared to traditional text-only sentiment analysis methods. This enhanced sentiment analysis framework has broad applications, including customer service, mental health monitoring, and human-computer interaction, where understanding and appropriately responding to human emotions are paramount. By bridging the gap between textual and vocal sentiment analysis, this research contributes to the development of more empathetic and responsive AI systems, ultimately fostering more natural and effective human-machine interactions.

Keywords – Sentiment Analysis, Emotion Detection, Textual Analysis, Vocal Analysis, Natural Language Processing (NLP), Machine Learning, Deep Learning, Audio Processing, Hybrid Model.

Paper No. ICRRCE-044

IoT based robust machine learning band to predict heart disease

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Abstract – Heart disease remains a major global health issue, causing over 17.9 million deaths annually, considering the importance of early detection to lower death rates. Current diagnostic methods frequently depend on costly procedures, resulting in delayed treatment and worst outcomes. This project uses machine learning-based predictive band employing ensemble algorithms to improve heart disease prediction accurately. By analyzing a comprehensive dataset of patient records, we seek to identify key health indicators linked to heart disease, then reduce the dataset's dimensionality from fourteen to six relevant attributes using classifiers like Naive Bayes, Helper Vector equipment, & Random Forest. The goal of this study is to create an efficient tool for healthcare professionals to detect issues early, using machine learning algorithms to reveal hidden patterns in data. This comprehensive methodology covers data collection, feature extraction, model training, as well as analyzing, forming a robust framework to enhance prediction accuracy and enable timely intervention. Our system suggests involves sophisticated methods such as Principal Component Analysis for feature extraction and Weighted K-Nearest Neighbors for classification and solving the problem areas of current systems. The method enhances prediction performance while aiding doctors who have been trained, and it supports scalability and aligns with medical standards. There is evidence of improved prediction and identifies machine learning potential in the management of heart disease. The integration of IoT and machine learning enables real-time health monitoring and prediction of heart disease. Wearable IoT sensors collect real-time physiological data such as heart rate, blood pressure, and oxygen saturation. Machine Learning Models like SVM, RF, NBC helps in accuracy.

Keywords–Early detection, Predictive modelling, Timely intervention, Health indicators, Prediction performance, Prediction Accuracy.

Paper No. ICRRCE-045

A Comparative Evaluation for Liver Segmentation from SPIR Images and A Novel Set Method Using Signed Pressure Force Function

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Abstract – In this research article, a brief review of the survey of the works done by various authors w.r.t. the topic of Comparative Evaluation for Liver Segmentation from SPIR Images and A Novel Set Method Using Signed Pressure Force Function is presented in a nutshell along with their advantages & drawbacks. To start with, 100's of research papers was collected from various sources, studied @ length & breadth, their advantages, drawbacks, etc. was analyzed and a review paper was published in a reputed conference & in a scopus indexed journal. In this chapter, only an exhaustive literature survey of the research works done by various authors across the globe till date is being presented w.r.t. the work taken up in this exciting & application-oriented field of composites.

Keywords – Liver, Segmentation, SPIR, Images, Signed Pressure, Review

Paper No. ICRRCE-046

Smart Environmental Monitoring System Using Different Supervised Machine Learning Algorithms
(Smart Weather Station for Environmental Parameters Monitoring Using Different Supervised Machine Learning Algorithms)

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Abstract – The increasing accuracy of weather monitoring is important for various industries, agriculture and emergency management. This study presents a smart weather monitoring system that leverages machine learning algorithms to predicts weather conditions. Temperature, humidity, windspeed, pressure, and gas concentrations were among the contaminants on the dataset we used for training. This study explores Random forests, gradient boosting machines (GBM) support vector machines, and linear regression ensemble models are a few examples of machine learning algorithms. Convolution neural networks (CNN) and artificial neural networks (ANNs) are examples of sophisticated deep learning approaches. Smart Environment is predicted, and it is communicated to the customer/service provider by using IOT implementation such as Arduino in combination with WIFI/GSM module. The findings emphasize the potential of ML to considerably improve the efficiency and accuracy of environmental monitoring systems.. By providing real-time assessments of environmental safety, this ML-enabled approach offers a robust solution for early detection The intelligent weather monitoring system possesses the capacity to enhance meteorological predictions and decision-making processes and improved resource allocation.

Keywords – Weather forecasting, Machine learning, Smart weather monitoring, Real-time data analytics, IoT sensors.

Paper No. ICRRCE-047

AI Adoption in Talent Management through Upskilling to Ensure Sustainable Employment

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Abstract - To ensure sustainable employment organisations are prioritizing Upskilling Initiatives. The rapid adoption of Artificial Intelligence (AI) in Talent Management is reshaping Workforce dynamics. To Promote Continuous Learning, enhance Workforce productivity AI- driven learning pathways has emerged as a powerful to address Skill gaps. This study explores the transformative impact of AI in Talent Management, focusing on how AI-powered training programs influence employee retention, engagement and skill development. The research employs a bibliometric analysis using scholarly database such as Scopus, Web of Science (WOS) and Google Scholar, analysing peer-reviewed articles from the year 2013 to 2025. The cluster analysis identifies three major thematic areas: AI driven workforce transformation, skill development and continuous learning. Findings reveal that organisations leveraging AI- based training modules experience a 40-60% increase in workforce efficiency and adaptability. However, the study also highlights significant challenges, including skill mismatches, Low AI adoption rates, ethical concerns and privacy issues. Notably, while 33% of organisations have adopted AI technologies, only 16% fully utilize their potential in workforce Upskilling, emphasizing the need for structured learning frameworks and policy interventions. The study further identifies a critical research gap in understanding AI adoption in emerging economies and its impact on workforce sustainability. The study provides insight for policymaker, HR leaders, and business strategies to integrated AI-powered Talent Management solution, promoting workforce resilience in VUCA environment. Emphasising continuous Upskilling through personalized learning pathways to ensure sustainable employment.

Keywords - AI Adoption, Talent Management, Upskilling, Bibliometric, Meta, Cluster Analysis, Sustainable Employment, AI driven pathways, VUCA, Continuous Learnings.

Paper No. ICRRCE-048

Latent Space Sparse Interaction Graph Networks (LSSIN) for Advanced Tumor Segmentation

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Abstract – Tumor segmentation plays a pivotal role in medical imaging research, particularly in clinical decision-making applications such as diagnosis and treatment planning. However, existing methods often struggle with robustness due to variations in tumor shape, intensity, and texture. To address these challenges, this paper presents a novel segmentation framework, latent space sparse interaction networks (LSSIN), which leverages graph-based sparse interactions in the latent space. The proposed model integrates multiple feature representations through a learned latent embedding while enforcing sparse feature interactions via an interaction modulation layer (IML). Initially, a graph-based message passing mechanism refines high-dimensional representations, ensuring accurate local boundary segmentation while preserving global consistency. This formulation simplifies optimization while enhancing model efficacy. Experimental validation on kidney tumor segmentation tasks demonstrates that incorporating sparse graph interactions improves boundary delineation, achieving a dice coefficient of 0.92. Further ablation studies reveal that removing the dynamic interaction modulation or the Kronecker graph propagation mechanism reduces performance, lowering the dice coefficient to 0.85 and 0.88, respectively. Additionally, the method reduces computational overhead by 30 percent, making it highly suitable for medical imaging applications where both precision and efficiency are crucial. These results highlight the potential of LSSIN for robust, computationally efficient tumor segmentation across diverse medical imaging datasets.

Keywords –A Latent space, Computational efficiency, Graph-based propagation, Sparse inter action networks, Tumor segmentation

Paper No. ICRRCE-049

RAG-Based Robotic Vision Model for Adaptive Waste Sorting and Classification

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Abstract – Effective waste sorting and classification are critical for sustainable waste management; however, current automated systems often lack adaptability and contextual awareness, limiting their accuracy and applicability. We propose a novel robotic vision framework utilizing Retrieval-Augmented Generation (RAG) for adaptive waste classification. This framework integrates real-time visual perception with context-specific knowledge retrieved from an external waste management ontology, enhancing object recognition through recyclability, contamination status, and specialized handling insights. Unlike conventional methods dependent solely on pre-trained datasets, our approach dynamically aligns visual data and contextual embeddings to effectively manage complex waste scenarios, including ambiguous or damaged items. Quantitative assessments on a heterogeneous waste dataset revealed the proposed model significantly outperforms traditional methods, achieving an 18% increase in classification accuracy and a 25% improvement in correct recyclability identification. Additionally, our framework markedly reduced hazardous material misclassification, thus enhancing safety in waste management operations. Experimental validations confirm the robustness and flexibility of the RAG-based system, underscoring its practicality for real-world waste sorting applications. By combining intelligent context-awareness with visual adaptability, our robotic vision framework advances sustainable waste classification and automation.

Keywords – Retrieval-Augmented Generation (RAG) Robotic Vision Waste Classification Adaptive Sorting Context-Aware Automation Sustainable Waste Management

Paper No. ICRRCE-051

Design Of Low Power Circuits Using Stacking Techniques

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Abstract –The high-speed performance and energy efficiency of static random-access memory (SRAM) make it an essential component of contemporary Very Large-Scale Integration (VLSI) chip design. This study examines important performance metrics including power consumption while concentrating on the design and analysis of a 6T SRAM cell. Cadence Virtuoso is used in the study to validate the suggested methods and perform thorough simulations. The stacking technique is used in this study's SRAM design to increase efficiency and further reduce power consumption. By using this strategy, the leakage current is greatly decreased, improving energy efficiency all around. The results aid in the creation of memory solutions for sophisticated digital systems that are low-power and high-performance.

Keywords – CMOS Technology, 6T SRAM Cell, low Power Consumption, Cadence Virtuoso.

Paper No. ICRRCE-052

Deep Learning & ML Based Multi-Modal Medical Image Fusion

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Abstract – Health is primary wealth for human existence. It's more crucial than ever to preserve health in this fast-paced world of today. Setting physical and mental health as a top priority is now essential rather than optional due to the rise in lifestyle-related illnesses, rising stress levels, and environmental difficulties. We are concentrating on advancements in multimodal medical image technology since it is more important to use precise diagnostic tools to identify anomalies in the human body these days. In earlier approaches, they employed conventional techniques for the Multimodal medical picture fusion takes more time and presents several difficulties. In this project, we are now using a deep learning model that was created using convolutional neural network technique in conjunction with Guided filtering (GF), non-subsampled shear let transform (NSST), and for the optimum medial multimodal image. By combining several images with different sources into single image that may be used for better diagnosis is the key primary goal of image fusion in the context of multimodal medical images. The quality of image fusion will be greatly enhanced by utilizing NSST and GF in conjunction with the CNN algorithm in Anaconda Navigator-Spyder software in python language. Deep learning techniques have advanced significantly, and by effectively utilizing them, image fusion algorithms can become even more efficient. Additionally, it will help to enhance the fusion effect, clarity of image details, and time in the future.

Keywords – Multi-modal medical images, Deep learning, image fusion, diagnosis.

Paper No. ICRRCE-053

Arduino based Vehicle Overload Detection and Prevention System

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Abstract –This study focuses on how to prevent vehicle damage caused by overloading. Problems caused by trucks include unbalanced trucks, stalled brakes, property damage, financial disruptions, suspensions, loss of control and road gas. New technologies are being developed to enable more effective scanning and management. Weigh-in-Motion (WIM) technologies allow for the weight of vehicles in traffic without affecting operations, but these technologies only adjust the weight of the vehicle and do not cover overloading or incorrect loading of the vehicle. Recently, we have developed and implemented the WIM system, which allows vehicles to operate more smoothly and efficiently. Our biggest innovation in this area is that when a truck is overloaded, a notification is sent to the driver via the device and an audible warning is used to warn the driver about the overload. The situation ends and then the power is cut. a delay. So, in any case, the user will not be able to start the vehicle unless he diminishes the load on the vehicle.

Key Words- Overload, Suspension system, Ignition, Arduino uno, WIM system, LCD display

Paper No. ICRRCE-054

Smart Pill Expert System for Bipolar Disorder Patients using IoT

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Abstract – This article describes the use of capsule specialists' development strategy. This Project is really helpful for bipolar disorder patients who have frequent mood swings. The proposed method is used to ensure that the drug is delivered accurately with in a given time. This project specification can be used by users of all ages at home, in the office, in the hospital, and can expand its capabilities to a larger people. With the help of the project, we can monitor the patient medication. Alerts and messages will be sent to the user according to the antibiotic results. The Smart Pill Box primarily focuses on providing an “overdose” feature to prevent a user from having to take medication to prevent overdose if they do not take the medication within the scheduled time. The Pill Box is tested and the results can be seen daily. Medications are an important part of health care, disease prevention, chronic disease management and treatment. Excellence Medication Automatic Teller Machine (ATM) is a machine that dispenses medications in emergency situations and ensures that medications are available 24/7. They play a key role in saving lives in the event of an emergency on highways, remote areas, rural areas and medical facilities that are outside the jurisdiction of ATMs.

Keywords—ESP8266 NodeMCU microcontroller, infrared sensor, DC RPM motor, 16X2 LCD, L298n motor driver, buzzer, embedded C, Arduino IDE

Paper No. ICRRCE-056

Ecobin : A Sophisticated Approach to Waste Management

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Abstract - In this study, we present a waste management system that uses GPS and GSM wireless technology to separate trash and keep tabs on it. In order to keep the environment clean, intelligent waste management is crucial. Reason being, modern society's biggest problem is disorganized and non-systematic garbage collection. Consequently, we must find a way to efficiently gather trash. We have provided an integrated platform for trash segregation and monitoring as a solution to this challenge. An embedded system will monitor the quantity of garbage placed. The garbage is first classified into dry, metal, and wet categories during segregation. Then, during monitoring, sensors are inserted in the bins containing dry and wet waste, and the level of each bin is relayed via GSM with GPS locations. In addition to offering a cost-effective option for collecting vast amounts of data The Internet of Things, or IoT, is a network of linked computers that can send data without requiring human intervention.

Keywords - Smart waste management, GPS and GSM technology, Smart cities, Sensor-enabled bins, Waste segregation, Environmental sustainability, Automated waste management system.

Paper No. ICRRCE-057

Comprehensive Safety System for Accident Mitigation using Sensor Networks

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Abstract – According to statistics from the World Health Organization, approximately 1.3 million people die in traffic accidents every year. The aim of the program is to create a collaborative approach to prevent accidents and improve accident management. The system combines sensors to monitor driver behaviour and conditions in the vehicle: blink sensors detect drowsiness, breath alcohol sensors measure breath alcohol, temperature sensors measure engine and cooling, and MEMS sensors instantly detect vehicle movement, while impact sensors help prevent collisions. These sensors are connected to a microcontroller that processes the data and communicates with the IoT module to provide timely alerts, thus increasing road safety and reducing accidents. This project shows how to develop and implement an alcohol detection system utilizing an Arduino UNO as the main control unit (MCU) for an automobile's engine lock feature and an ultrasonic sensor. The breathalyser's alcohol level will be continuously monitored by the system, which will cut the engine when it reaches a threshold. Additionally, the model will transmit traffic statistics to any location within SIM900A. This concept offers a practical way to reduce accidents caused by drunk drive.

Keywords – Vehicle accident detection, Arduino Uno, GPS Module, GSM Module, Obstacle Sensor, MEMS Sensor, Temperature Sensor, Alcohol Sensor.

Paper No. ICRRCE-058

Design and development of Wallace tree multiplier using CMOS 45nm Technology

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Abstract – In this paper, we present an effective electrocardiogram (ECG) grouping technique utilizing deep Artificial neural network (ANN). There are many current medical applications which give more importance to ECG. There are many DL solutions which can be used for identifying and analysis the ECG dataset. Due to this ECG signal screening finding how many people are affected by heart diseases as well as Diabetes. The ECG information data is taken in an unmonitored way. Which performs with large quantity of raw ECG data as inputs to an Artificial neural network. When every beat of ECG transforms into a 2D grayscale as an input data for ANN classification. A pre-preparing step will be executed on the electrocardiograms (ECG) for pattern evacuation. The decreased component vector was utilized as the as contribution of neural system. The diminished element vector is utilized as a contribution to a neural system. Our exploratory outcomes effectively approve that the performed ANN categorizer with the changed ECG pictures can accomplish super characterization precision with no manual pre-preparing of the ECG flags, for example, commotion, highlight extraction, and highlight decrease.

Keywords – Electrocardiogram (ECG), Artificial Neural Network (ANN)

Paper No. ICRRCE-059

Identification of identical twins using Deep Learning

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Abstract – Identifying identical twins is a challenging task due to their genetic similarity and physical resemblance. Traditional biometric methods, such as fingerprinting or iris scans, are often ineffective in distinguishing between identical twins. Deep learning has recently gained prominence as an effective method for advancing biometric identification. This paper introduces an innovative method for identifying identical twins using deep learning techniques. The proposed method utilizes A structure based on Convolutional Neural Networks architecture to extract discriminative features from facial images of identical twins. The CNN is trained on a large dataset of twin facial images, leveraging the slight variations stemming from shared genetic characteristics. Transfer learning is employed to fine-tune the pre-trained CNN on the twin dataset, enhancing its ability to differentiate between the twins. Experimental results on a dataset of identical twins demonstrate the impact of the current approach, achieving a high level of accuracy. The model's Performance is measured using indicators including precision, recall, and F1-score, demonstrating its superiority over traditional methods. Overall, the proposed method offers a reliable and efficient solution for identifying identical twins, with potential applications in fields such as law enforcement, healthcare, and security.

Keywords–Deep Learning, Convolutional Neural Networks (CNNs), Facial Feature Extraction, Twin Differentiation.

Paper No. ICRRCE-060

Advanced Waste management system-Smart Garbage monitoring with GSM and GPS powered Real time alerts and Notifications.

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Abstract – Squander observing may be a basic perspective of urban framework, influencing open wellbeing, natural maintainability, and in general quality of life. These strategies are habitually wasteful, driving to issues like flooding containers, unattractive litter, and expanded operational costs. To address these issues, an Brilliantly squander canister checking and caution framework utilizing Remote innovation leverages cutting-edge innovation to optimize squander collection. A Smart-Waste Monitoring Process advancement marks a striking movement within the way cities and regions handle squander. By leveraging sensor innovation, information analytics, and proactive support, this method not as it were empowering the proficiency and cost-effectiveness of overseeing squander but too contributes to a cleaner and more feasible urban environment. It upgrades the resident's standard of living and bolsters worldwide endeavours to diminish squander and its natural effect. This extend will send an alarm at whatever point it recognizes fire and smoke MQ2. It has too associated with a buzzer and an Driven which is able act as a visual sign for caution SMS with area sent to keen phone utilizing GSM and GPS. This venture presents the improvement of a shrewd rubbish checking framework in arrange to degree squander level within the waste container in real-time and to caution the district, in specific cases, through SMS with area utilizing GPS. The proposed framework is comprised by the ultrasonic sensor to degree the squander level, the SMS is sent using the GSM, and an Arduino controller which controls the framework operation. It assumes to generate and send the caution messages to the region by means of SMS when the squander canister is full or nearly full, so the trashcan be collected promptly. Moreover, it is anticipated to contribute to progressing the effectiveness of the strong squander transfer administration. This framework comprises of an Arduino microcontroller, a rubbish dustbin stacked with ultrasonic sensors and they are checked persistently through a checking board at the control office with the assistance of GSM & GPS module. We may dump the squander within the government apportioned containers in area/locality or hand it over to the entryway-to-entryway collectors and after that the rubbish ought to reach its conclusion location which is exceptionally vital and that where our proposed demonstrate is getting to fit in.

Keywords- Arduino Nano, Gas sensor, Flame sensor, PCB, GSM SIM800C, GPS, Arduino IDE, Embedded C

Paper No. ICRRCE-061

Interactive health monitoring using arduino and touch sensor based voice conversion system

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Abstract – Sounds are the means by which all individuals communicate with one another and transmit their thoughts and ideas. We all use sounds to communicate our ideas and emotions to one another. For individuals who are hard of hearing or unintelligent, this is unacceptable Furthermore; sign language is usually utilized while interacting with people. Each word embodies a particular statement from a unique action. Gestures have a poor success rate because most people are not familiar with them. This innovative research from India tackles communication challenges for the deaf using sensor-based gloves powered by an Arduino Nano. Equipped with infrared sensors, touch sensors, heart rate sensors, and temperature sensors, Touch sensors converted into voice recognition and also along with text displayed on a 16x2 LCD and audio output through the APR33A3 voice module and text-to-voice software. This approach is useful for creating a system that acts as a bridge and the gap between dumb people, physically handicapped persons and also old people enabling complex explanations can be reduced. Touch sensors-based models and different sensors can improve accuracy, fostering inclusivity and better communication for the hard of speaking. Additionally, the system monitors patients' health and needs, enhancing its utility. They use a variety of hand gestures, facial expressions, and orientation to communicate their views to ordinary people.

Keywords – Arduino Nano, Touch sensors, 8 Channel Voice Recording Playback Module APR33A3, Heartbeat sensor, DHT11, Arduino IDE.

Paper No. ICRRCE-062

Gold-MoS₂ Coated Photonic Crystal Fiber-Sensor for Breast Cancer Identification Using Surface Plasmon Resonance

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Abstract – The development of a unique biosensor with gold-MoS₂ coated photonic crystal fiber (PCF) for enhanced detection sensitivity using surface plasmon resonance (SPR) is proposed. The integration of MoS₂, a two-dimensional material with remarkable optical and electrical properties, with gold nanoparticles on the PCF surface provides a highly sensitive platform for detecting biological and chemical analytes. The proposed biosensor demonstrates significant potential in real-time, label-free biosensing applications, with the ability to identify MDAMB-231 cancer cell for the breast cancer type-1 detection. Our findings highlight the promising capabilities of this gold-MoS₂ PCF biosensor for future applications in clinical diagnosis, ecosystem monitoring and food inspection.

Keywords - Surface plasmon resonance, photonic crystal fiber, gold, MoS₂, biosensor, cancer cells.

Paper No. ICRRCE-063

Under water Image Enhancement Using Variational Frameworks

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Abstract –This project presents an effective method for underwater image restoration by addressing the common challenges of distortion and noise in underwater environments. The proposed approach includes three main stages: background light estimation, transmission map calculation, and image restoration using a variational framework. Initially, background light is estimated by identifying the brightest pixels from the dark channel, which represent the scene's background illumination. This step is crucial for enhancing the contrast of submerged images. Following this, a transmission map is calculated using a simplified dark channel prior to model the haze effect in underwater scenes. To refine the initial transmission map, a first-order guided filter is applied, resulting in a more accurate representation of image depth and object visibility. Noise simulation is introduced to mimic real-world underwater noise, with noise removal performed using median filtering for improved clarity. Finally, the restored image is generated using a variational framework based on the transmission map and background light. The result is a clear, visually enhanced image that mitigates haze and noise while improving feature visibility. This method can be particularly useful for underwater imaging applications such as marine biology, underwater exploration, and underwater robotics. The implementation is carried out in MATLAB, leveraging its image processing capabilities.

Keywords –Underwater Images Dataset, Pre-Processing, Image Processing Techniques and Enhancement.

Paper No. ICRRCE-064

Identifying Pests and Recommending Pesticides by Predicting Leaf Conditions using Deep Learning Techniques

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Abstract – In India, The Agricultural lands are reported nearly 60% in 2022. Most of the Industries are developed for processing the agricultural products and releasing in the market. The Farmers who are cultivating the crops are facing the financial problems. Here we are focusing on the advanced agricultural practices to reduce the loses and also to improve the production. Deep learning algorithms are used to detect the pests which are present in the agricultural lands and also to Recommend a specific fertilizer to reduce the effect of pests. Preprocessing techniques such as image resizing, grayscale conversion, and threshold segmentation are used. After that, The CNN algorithm is utilized to identify pests. The enhanced precision of the developed model is evaluated to find its effectiveness for getting the exact identification of the pests. The findings of this study for advanced precision agriculture give a trustworthy instrument for early detection and Management of leaf diseases along with efficient control of pests.

Keywords – Deep Learning, Convolution Neural Network, Pest Detection, Recommendation, Classification.

Paper No. ICRRCE-065

Enhanced Stability 12T SRAM Design with 45nm Technology

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Abstract – A Static Random-Access Memory is a type of semiconductor storage used to store every bit. It is referred to as volatile memory because it relies on a constant voltage supply to maintain the stored data. In contemporary digital systems, the SRAM cell serves as the primary memory device. Despite being speedier, SRAM cells have a high leakage current, which raises their power consumption. This proposed method addresses the half-select issue found in 6T and 7T SRAM cell. Extensive simulations are conducted using industry-standard Electronic Design Automation (EDA) tools to evaluate the performance, power, and area (PPA) metrics of the proposed design. The results show that the 12T SRAM cell achieves improved robustness and energy efficiency compared to traditional designs, making it suitable for modern applications in IoT devices, mobile computing, and artificial intelligence. By providing a practical and scalable look at meeting the demands of future memory technologies and addressing the challenge in working in nanometer - scale technologies, this project promotes the field of VLSI design.

Keywords –Cadence, SRAM, transistors and power consumption.

Paper No. ICRRCE-066

Secure Mail and URL Detector

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Abstract – In the ever-evolving landscape of cybersecurity, the need for robust threat detection mechanisms has become paramount. Traditional approaches often fail to deal with complex threats such as fishing and business email compromise attacks (BEC). To address this issue the project plans to develop a threat detection system that uses machine learning technology. The engine includes advanced algorithms and data to achieve better accuracy and efficiency in threat detection. Key capabilities include continuous threat detection and detection of a variety of threats including fishing BEC similar websites, similar domains, and compromised IP addresses. The project uses a variety of supervised and unsupervised learning algorithms for classification and anomaly detection using different types of information such as email headers, text content IP addresses and registration forms. Experimental results show that the proposed method is effective and the detection accuracy is better compared to the traditional method. The finding of the project is expected to improve cyber security measures and reduce the risks posed by evolving cyber threats.

Paper No. ICRRCE-067

Footstep power system to convert kinetic energy to Electrical energy by using IoT

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Abstract – As the population and power demand increase, energy wastage also rises. This project focuses on generating electricity from footsteps using piezoelectric transducers placed on footpaths. When pressure is applied, the transducers transform mechanical energy into electrical energy, which is then stored in a battery. The stored power can be utilized to charge mobile devices and power streetlights via a DC to AC converter. This method provides a cost-effective and eco-friendly solution for energy generation in high-footfall areas like railway stations and busy streets. The system also has a device to measure voltage and a screen to display the produced electricity. Piezoelectricity offers a pollution-free alternative energy source by utilizing otherwise wasted energy from human movement. This approach maximizes efficiency and reduces dependence on conventional energy sources.

Keywords – Footstep power generation, piezoelectric transducer, energy harvesting, renewable energy, mechanical to electrical conversion, battery storage, DC to AC conversion, streetlight automation, pressure transducer, sustainable energy, smart city solutions, power generation from footsteps, non-conventional energy sources.

Paper No. ICRRCE-068

A Comprehensive Literature Review on Ransomware Detection, Sensitive File Tagging and Proactive Encryption Strategies

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Abstract – With the complexity of most recent offenses on the networks, good intelligent proactive protection has become an absolutely urgent necessity. This paper presents a semi-implemented AI-based scheme for early identification of ransomware activity by way of behaviour logging and intelligent analysis. Our framework is composed of three main components: a web dashboard for real-time monitoring, a behaviour-based feature machine learning model, and an email-based alarming system. Although under continuous development with ongoing efforts like location-based tagging of sensitive files and refining of the overall model evaluation, preliminary implementation generates a working pipeline for the collection, analysis, and display of system-level activity. This paper also provides a literature-based explanation of these components while giving insights into the actual design decisions adopted during development. Future work will see a more automation-oriented system with improved detection capabilities and system-level responses.

Keywords – Ransomware detection, machine learning, deep learning, sensitive data tagging, proactive encryption, privacy-preserving techniques, real-time monitoring, fuzzy fingerprints, homomorphic encryption, Named Entity Recognition (NER).

Paper No. ICRRCE-069

Cervical Cancer Detection Using Machine Learning Techniques

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Abstract –Cervical cancer is a significant health threat to women, but early detection dramatically increases survival rates. Current screening methods, while valuable, rely on subjective interpretations by medical professionals, leading to potential inconsistencies. To address this, we've developed WFC2DS, a web-based system that uses advanced machine learning to analyse medical data, such as images and test results. This system employs an ensemble of algorithms, meaning multiple computer programs work together, to provide a more accurate and objective assessment than traditional methods. WFC2DS is a useful tool for doctors that helps them find possible indicators of cancer and, ultimately, aims to improve early detection and diagnosis. By providing a consistent and data-driven analysis, WFC2DS strives to enhance the accuracy of cervical cancer screening, ultimately contributing to better patient outcomes and saving lives, all while prioritizing patient data privacy and security.

Keywords –The Question Asker (Decision Tree), The Risk Calculator (Logistic Regression), The Divider (SVM), The Neighbor Watcher (KNN), adaptive boosting, gradient boosting, random forest, and XG Boost.

Paper No. ICRRCE-070

Farmer Assistant Portal

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Abstract - Modern technological advancements have significantly improved human lifestyles. These innovations play a key role in solving global agricultural challenges. This research presents a new approach to optimizing farming practices through a Java-based application. The aim is to reduce manual agricultural management efforts while providing insights based on seasonal variations. The agriculture industry, subject to market fluctuations and financial uncertainties, requires adaptive solutions. Many farmers, particularly those managing small to mid-sized farms, do not leverage such tools due to a lack of awareness and the complexity of existing systems. This project seeks to bridge that gap by offering an accessible and efficient farm management solution.

Keywords – Farming, Crops, Products, Admin, Customer, Orders, Expert, Buyer.

Paper No. ICRRCE-071

Brain Tumor Detection Using Bilateral Filter and Modified Spatial Frequency

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Abstract – Malignant brain cancer is the ultimate outcome of uncontrolled proliferation of brain cells, which in turn causes a host of other neurological disorders. There are significant obstacles to early diagnosis that can be overcome with the use of a Computer-Aided Diagnosis (CAD) system. One of these obstacles is the proper identification of various diseases in MRI images. To improve the accuracy of magnetic resonance imaging (MRI) scans for the detection of brain malignancies, this research proposes a five-stage pre-processing method that includes Modified Spatial Frequency (MSF). In order to improve the quality of the brain image, the design employs adaptive histogram equalization and bilateral filtering to eliminate noise. After that, the improved image is divided into four equal parts, and MSF is determined for each of those parts. Finally, the image containing the brain tumor is located in the quadrant with the highest MSF. The present research compares the suggested architecture to existing models that are discussed in order to demonstrate its merit. The MRI brain tumor detection accuracy reached an impressive 97.82% with a precision of 94.55%, a sensitivity of 99.19%, a specificity of 95.73%, and an F-score of 97.95%. The experimental results demonstrate that the suggested architecture is robust, leading to an improvement in the detection accuracy of brain tumors in various locations.

Keywords – Magnetic Resonance Imaging, Modified Spatial Frequency, Bilateral Filtering, CAD

Paper No. ICRRCE-072

Analysis and HeatWave Prediction in Rayalaseema Region Using Unsupervised Machine Learning Algorithms

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Abstract – Heatwaves are extreme meteorological conditions that create a disastrous threat to the environment, economy, and public health. The purpose of the project is to develop a certain framework for predicting and analyzing heatwaves using machine learning. That would use historical climate data from India to train and evaluate Random Forest, Support Vector Machine, and Convolutional Neural Network models. The project would explore spatial and temporal trends, ascertain the crucial atmospheric and meteorological variables responsible for heatwave set-up, with recommendations aimed at improving heatwave prediction and early warning systems. It is expected to develop an effective heatwave prediction model, identify features that impact heatwave formation, and apprehensively examine certain heatwave characteristics.

Keywords – Heatwave prediction, Machine learning, Climate analysis, Weather forecasting.

Paper No. ICRRCE-073

Au-TiO₂ Functionalized Photonic Crystal Fiber Biosensor for Detecting Blood Components

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Abstract – A plasmonic biosensor based on photonic crystal fiber (PCF) is suggested for precise blood composition analysis. The sensor utilizes gold and TiO₂ layers to improve the sensitivity. To recognize different blood components, such as water, plasma, white blood cells (WBCs), haemoglobin (HB), and red blood cells (RBCs). The surface plasmon resonance (SPR) theory underlined titanium dioxide coated photonic crystal fiber (PCF). The gold layer acts as a plasmonic material, while the titanium dioxide layer strengthens the link between the gold layer and the PCF surface. The wavelength sensitivity of the designed structure is proven to be 13458 nm/RIU and the confinement loss for the RBC (RI= 1.40) blood cell is found to be 50.97 dB/cm.

Keywords – Au-TiO₂ functionalization, Photonic Crystal Fiber (PCF), biosensor, blood components

Paper No. ICRRCE-074

Real-time IoT-based Solar-Powered Environmental Monitoring System

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Abstract – Keeping track of the environment is crucial for grasping and tackling problems like pollution, climate shifts, and ecological issues. This project presents a real-time monitoring setup powered by solar energy, using a Node MCU tied into the Internet of Things (IoT). It constantly gathers details on things like temperature, humidity, voltage, and current through sensors connected to the Node MCU microcontroller. Running on solar power, it's eco-friendly and perfect for places far from the grid. The data flows via Wi-Fi to an IoT cloud platform, showing up instantly on simple dashboards. Users can also set warnings for big environmental changes. Built for energy savings, renewable power, and flexibility, it fits well in environmental research, smart urban areas, and agriculture. This system brings a smart, affordable way to collect and study environmental info while boosting sustainability.

Keywords – ESP8266 Node MCU microcontroller, DHT11 sensor, Voltage sensor, Current sensor, LCD display, Buzzer, Battery, Solar panel.

Paper No. ICRRCE-075

Towards Intelligent Therapy for Speech Sound Disorders: A Review of Articulation Therapy Apps and GPT-Based Advancements

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Abstract – Speech Sound Disorder (SSD) is characterized by difficulties in articulation, leading to mispronunciations that impact clear communication. Early detection and customized therapy are essential for effective treatment. This paper explores multiple methodologies for SSD therapy support, with an emphasis on integrating Generative Pre-trained Transformers (GPT)-based models for phoneme-specific sentence generation. Using a GPT model, sentences containing user-specified phonemes were generated, ensuring grammatical accuracy to support targeted phonetic practice. Experiment results indicate that leveraging AI-based models, such as GPT for phoneme-focused generation of sentences, can significantly enhance therapy outcomes by providing tailored interventions, also reducing the Speech Language Pathologist (SLP's) workload. Our findings underscore the potential of these technologies to support more accessible and effective SSD therapy, particularly with future expansions to include region-specific language support, to aid diverse linguistic populations.

Keywords –Speech Sound Disorder (SSD), GPT-based Language Model, AI in Speech Therapy, Personalized Speech Intervention Tools.

Paper No. ICRRCE-076

Query AI: An AI-Powered Data Query Interface

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Abstract – This paper compares two AI-powered systems for SQL query generation, WrenAI and QueryAI. Both models use advanced language models to convert natural language input into SQL queries, but they differ significantly in their design and performance. WrenAI uses the OpenAI API, which is a flexible and general-purpose solution that can handle a variety of natural language processing tasks, including SQL query generation. On the other hand, QueryAI uses the Gemini API, which is a more specialized model, optimized for working with structured data, especially SQL databases. This paper discusses the strengths and weaknesses of each approach, highlighting the role of prompt engineering and model specialization in improving the accuracy and efficiency of SQL query generation. QueryAI shows better performance in generating accurate and optimized SQL queries, while WrenAI is more versatile across different use cases. The comparative assessment comprises of query accuracy, precision, recall, and F1-score as metrics, thus pointing out the trade-off flexibility against specialization in AI-generated queries. The findings shed light on selecting appropriate AI models for SQL-based applications for the choice between general-purpose and domain-specific models.

Keywords – NLP, SQL Query Generation, OpenAI API, Gemini API, WrenAI, QueryAI, AI Models, Structured Data, Query Optimization, Performance Metrics, Prompt Engineering.

Paper No. ICRRCE-078

IoT enabled automated smart water heater

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Abstract - The main aim to create a project based on the Internet of things (IoT) which used by human to interact with everyday appliances, which offers enhanced control and efficiency. A new method is proposed an IoT-based smart water heating management system for optimizing energy usage and to help the user in their convenience. Timers are designed to reduce heat loss and improve the efficiency of an electric powered water heating storage containers. Water heater timers are available for both indoor and outdoor applications. Along with the timer the temperature sensor can also be used in the system, so that water gets heated up to the set temperature and will get automatically switched off once the temperature is reached. Wi-fi module has also been integrated which gives live update of water heating coil on a mobile phone through Telegram bot. These data are transmitted to the microcontroller which is a mini computer, used to integrate the embedded systems and optimize the heating schedules accordingly. Various devices are available for heating water but people prefer the one which occupies less space and cost effective. The coils that are available in the market need to be monitored from time to time manually. Some features need to be added to reduce the time and energy. So, timer circuit is introduced to a water heater which we have named as "IoT enabled automated smart water heater". The benefits of this project include energy conservation, cost savings, and improving the user experience.

Keywords - IOT, Embedded system, Smart Water Heater, Energy Conservation.

Paper No. ICRRCE-079

Early Prediction of CVA Using AI

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Abstract – This project addresses the challenge of detecting brain strokes through both numerical and image-based data analysis using deep learning techniques. By integrating image processing and numerical data analysis, this solution offers a comprehensive approach to stroke detection. Numerical data, such as patient demographics and clinical information, is analyzed alongside medical images (like CT or MRI scans), enhancing prediction accuracy. The objective is to build a system that leverages convolutional neural networks (CNNs) and feature selection techniques to detect stroke patterns, providing faster and more reliable results. The system's dual approach – processing both images and numeric data – enhances its diagnostic capability, allowing healthcare professionals to make informed decisions based on a combination of data sources. Ultimately, this project aims to contribute to earlier and more precise stroke detection, reducing the likelihood of severe outcomes and improving patient survival rates. **Keywords** – Brain stroke, deep learning, CNN, image detection, numerical data, feature selection.

Paper No. ICRRCE-080

Parkinson's Disease Prediction Using Multiple Machine Learning Techniques

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Abstract – Voice-based biomarkers offer a promising method for diagnosing symptoms of neurodegenerative diseases such as Parkinson's disease (PD). PD is a prevalent condition, affecting approximately seven million adults worldwide, with around 150,000 new cases diagnosed annually. Traditionally, identifying PD has been challenging, as research often focuses on a limited set of symptoms while overlooking others due to reliance on independent scoring systems. Motor function decline is a key indicator of PD, and voice analysis has emerged as a potential diagnostic tool. However, traditional clinical approaches emphasize certain symptoms while neglecting others, leading to incomplete assessments. By utilizing independent measurement scales, voice-based biomarkers can enhance the accuracy of PD diagnosis. This paper presents evidence supporting the application of supervised classification techniques for diagnosing PD, using machine learning models, Random Forest, XGBoost, and AdaBoost. Additionally, the study incorporates various evaluation methods and metrics, such as the Confusion Matrix, Classification Report, Precision, Accuracy, F1-score, and Recall, to validate the effectiveness of these models.

Keywords – Parkinson's Disease, Biomarkers, Machine Learning Models, Decision Tree, Neural Networks, AdaBoost, XGBoost.

Paper No. ICRRCE-081

GAN-Based Augmentation to Enhance Data Set Using Advanced Deep Learning Techniques

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Abstract –Scientific literature has been growing exponentially, and in this regard, the need to extract and classify critical information using automated methods arises, especially concerning the identification of ‘problem’ and ‘method’ sentences within research papers. In agricultural computer vision, this need translates to distinguishing between ‘problem’ images—those depicting diseased crops, pest damage, or nutrient deficiencies—and ‘method’ images, which serve as healthy or controlled references. Accurate classification of such image types is essential for developing intelligent systems for crop monitoring, disease diagnosis, and precision farming. This paper focuses on the GAN-based data augmentation for image classification within agricultural datasets. By creating synthetic data, GANs can overcome the problem of data scarcity and reduce reliance on high-frequency visual patterns, which often results in overfitting. A number of GAN architectures are evaluated, including those that incorporate transformer-based modules to improve visual fidelity and semantic consistency. We investigate how these models can produce synthetic agricultural images that maintain domain-specific features that are essential for accurate classification, especially in imbalanced datasets where rare cases are underrepresented. This paper investigates the effectiveness of different architectures of GANs and data augmentation techniques for image classification tasks, focusing on the discrimination between problem and method image categories. Experimental results show the potential of improvements in classification accuracy, F1-score, and overall generalization when synthetic images are incorporated into the training process. These findings open the door to more reliable and scalable methods for analyzing agricultural image data and demonstrate the promise of GAN-driven data augmentation for deep learning applications in smart farming.

Keywords – GAN, data augmentation, sentence classification, scientific literature, NLP, text generation, synthetic data, imbalanced dataset, transformer model, semantic preservation, adversarial training, neural networks, model generalization, deep learning.

Paper No. ICRRCE-082

Bird vs UAV classification using CNN Architecture

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Abstract –There is rising presence of drones across various fields, from security to delivery services. This has created need for efficient methods to differentiate between birds and drones. Our goal is to accurately distinguish between birds and drones in images. Since both share similar flight patterns, identifying them can be challenging. This review explores various classification methods, including traditional machine learning and deep learning approaches. We also highlight how image augmentation helps prevent overfitting and reduces errors during training. Additionally, we discuss the evolution of these techniques, the benefits of synthetic data in model training, and the impact of recent competitions in advancing this field. Despite these advancements, the key challenge remains achieving both high accuracy and efficiency in real-time applications.

Keywords – Drones, Birds, Classification, Machine Learning, Deep Learning, Image Augmentation, Overfitting, Synthetic Data, Real-time Applications, Flight Patterns, Security, Delivery Services, Model Training, Competitions, Accuracy, Efficiency.

Paper No. ICRRCE-083

A Deep Learning-Based Framework on Creating Alert Messages for Wild Animal Detection Using Vision Transformers

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Abstract - Wild animal detection plays a critical role in safeguarding rural communities and forestry workers. To address this need effectively, we propose a Vision Transformer (ViT)-based model that enhances the accuracy and efficiency of detecting various types of animals. Unlike traditional Convolutional Neural Networks (CNNs) used in existing methods, our approach leverages the advanced capabilities of Vision Transformers to process visual data more effectively. This allows for improved pattern recognition and classification of wild animals in diverse environmental conditions. The proposed model is trained on a wildlife dataset from Kaggle, consisting of 90 animal classes, and demonstrates superior performance in terms of accuracy. Our experimental results showcase the advantages of ViTs over CNNs, highlighting their potential for scalable and adaptable wildlife monitoring solutions.

Keywords - Vision Transformers, Classification, Feed Forward Neural Networks, Animal Dataset, ml.g4dn.xlarge instance

Paper No. ICRRCE-084

IoT-Based Smart Kitchen with Enhanced and Automated Safety

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Abstract- An Smart kitchen with automation and monitoring enabled by the Internet of Things. Some of the technologies that enable the Internet of Things and its applications across a range of fields include identification of radio frequencies, cloud computing, and wireless sensor networks, and nanotechnologies, including smart homes, smart cities, and we have discussed Additionally, the project provides a focused discussion on smart kitchen we used a Node MCU to construct technologies. It highlights the various appliances used in a smart kitchen and their specific applications, alongside their roles in smart farming, smart health, and smart grid systems. Accidents involving kitchen shave become more common in both residential and commercial settings in recent years. Cooking takes place in the kitchen on a regular basis. However, in the event that the gas cylinder leaks, the circumstances will become hazardous. By utilizing Internet of Things (IoT) technologies, we hope to reduce kitchen hazards. Accidents can be prevented by remotely IoT technologies are being used to monitor the entire kitchen. This research will be implemented using both software and hardware. Hardware components included a gas detector, heat sensor, moisture sensor, servo motor, burning sensor, as well as the load-cell node MCU. The mobile application and Node MCU integration have been implemented from the software side. Our system delivers results via the system utilizes SMS alerts to monitor gas leakages in the kitchen, ensuring a faster response moment in the event of a leakage. In situations where a gas leak occurs suddenly at night, a person might instinctively turn on the light, potentially causing a blast. To prevent this, the primary power source will turn itself off. Additionally, the equipment observes kitchen devices, such as the gas cylinder, and notifies the user of any issues.

Keywords –Arduino IDE, ESP8266 Node MCU Microcontroller, Flame sensor, LCD display, PCB, MQ2 sensor, HX711 load cell, Buzzer, DHT11 sensor, Jumper wires, Blynk Application.

Paper No. ICRRCE-086

An Effectual Finest Feature Selection-based Multi-Task Learning Model exhausting Dilated Convolutional Neural Network with Enhanced Doctor and Patient process improvement

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Abstract-Multitask Learning (MTL) is attracting a lot of interest because it may transfer information across projects and increase teamwork by leveraging common frameworks throughout tasks to collaboratively construct an improved model for every assignment. Yet, most conventional MTL approaches only concentrates on choosing features across various tasks, concern on enhancing the limited number of learned parameters. MTL is rigorously demonstrated to increase extrapolation ability given a series of associated duties. Most MTL algorithms presume that every assignment is connected. Nevertheless, if each of the tasks is unrelated, there is a detrimental flow of data between them, and the effectiveness of the classic MTL process suffers. In this paper, the optimal feature selection approach is offered to perform the MTL. This work is initiated by collecting the data from the large dataset. From this collected data, optimal feature selection is performed using Improved Doctor and Patient Optimization (IDPO). The multi-objective functions like correlation coefficient, relief score, and chi-squared (χ^2) statistic are considered by the IDPO for enhancing the performance of the optimal feature selection process. Lastly, the optimally selected features are transferred to the Dilated Convolutional Neural Network (DCNN) for performing the MTL. The MTL accompanied by the large dataset and solves the multiple struggles. The existing approaches are compared with the results of the developed feature selection methodology to confirm its effectiveness.

Keywords-Multi-Task Learning; Optimal Feature Selection; Dilated Convolutional Neural Network; Improved Doctor and Patient Optimization

Paper No. ICRRCE-087

IoT based obstacle avoidance with accident alert robot

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Abstract – Building IoT (Internet of Things)-enabled collision and avoidance robots with a variety of control technologies, such as voice, terminal, and Bluetooth, is the aim of this project. An accident warning system that uses infrared and ultrasonic sensors is built into the robot concept to enable it to navigate its surroundings on its own and avoid obstacles. Additionally, there is a gear wheel-drive motor. “Voice mode, flying mode, and Bluetooth mode are all possible ways to control the robot. Where are you? The user can speak commands to the robot in voice mode and send commands to the robot through the terminal window in terminal mode. With a smartphone or tablet in Bluetooth mode, users can operate the robot wirelessly. The NodeMCU ESP8266 microcontroller card in the proposed system is setup with the ESP8266 IDE for NodeMCU. Transportation plays a significant role in our lives today, and its advancements make life easier. Nonetheless, we have witnessed significant accidents and injuries in recent years as a result of people attempting to disregard traffic signs. Napping and drinking water can be uncomfortable and should be done immediately before something goes wrong. In this study, a prototype has been developed using ESP8266 nodemcu IR, ultrasonic sensor that monitors to prevent accidents and provide safety services to drivers. The system uses IoT, machine learning and artificial intelligence (AI) in the vehicle to detect and prevent possible accidents. In case of a malfunction at a red light or in a vehicle in front, the vehicle stops and warns the driver through the sound system, thus saving many lives. The device has been tested and the results show that the device is effective and efficient. An Internet of Things (IoT)-capable Wi-Fi module makes it possible to link robots to the internet and control them remotely from anywhere in the world. A cloud-based platform receives the robot's data, including position and sensor readings, over the Message Queue Protocol (MQTT). Telemetry transfer protocol. The system's multiple control modes and adaptability allow it to be utilized for a number of tasks, such as industrial automation, security and surveillance, and building automation. All things considered, the suggested approach offers a sensible way to use IoT to create a personalized and efficient robot protection system with several control systems, infrared sensor, ultrasonic sensor, embedded C, Blynk application, and NodeMCU ESP8266 compiler.

Keywords – NodeMCU ESP8266/32 controller, Ultrasonic sensor, IR sensor, NodeMCU ESP8266 Compiler, Embedded C, Blynk Application

Paper No. ICRRCE-088

Study on Autism Spectrum Disorder for Early Detection and Prediction

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Abstract – autism spectrum disorder (ASD) poses significant challenges for early diagnosis and intervention, impacting developmental outcomes in children. Despite advancements in predictive modelling, many existing studies overlook critical factors such as class imbalance and feature selection. This paper aims to study the different Artificial-Intelligence (AI) approaches presented for ASD prediction/classification. Further, this work methodology involves conducting exploratory data analysis (EDA) to identify key trends and relationships within the ASD toddler's dataset. The EDA revealed balanced demographic representation and highlighted significant health indicators, such as jaundice and family history, influencing ASD traits. Notably, our findings indicate potential correlations between screening responses that can refine early detection methods in ASD toddlers. The novelty of this study lies in its integrated approach, addressing data preprocessing, thereby contributing valuable insights to the field of ASD research and fostering better early intervention strategies.

Keywords – Autism Spectrum Disorder, Artificial Intelligence, Machine Learning, Exploratory Data Analysis, Class Imbalance, Feature Selection.

Paper No. ICRRCE-089

Intelligent Software Integration for Pressure-Assisted Extrusion Chocolate 3D Printer

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Abstract – 3 dimensional printing technology has revolutionized edible design, making complex and personalized chocolate manufacturing possible. Here's a pressure-assisted extrusion chocolate 3D printer that allows for more precise and efficient printing, integrated with a melting unit. Compared to traditional syringe-based extruders, the pressure-assisted system uses pressure-controlled pumps to ensure constant chocolate flow and more structural stability. The extrusion setup allows for multiple types of chocolate for printing by increasing the scope of customization. The software dynamically changes the temperature, pressure, and flow rate in real-time to enhance accuracy and reduce errors. The experiment indicates that the addition of two dark and compound chocolates enhances stability and adhesion during printing; the Wi-Fi-based software helps in tracking chocolate printing through g-code, with a print history that calculates successful prints and failed prints. This system is better in efficient and versatile compared to traditional chocolate 3D printers and is ideal for commercial and research applications in chocolate additive manufacturing.

Keywords – Wifi software integration, pressure-assisted extrusion, 3D chocolate melt extruder design, chocolate 3D printer, and chocolate melting unit.

Paper No. ICRRCE-090

Advanced Fine-Tuning Techniques to Improve Image Quality in Stable Diffusion XL: A Detailed Analysis

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Abstract – Stable Diffusion XL (SDXL) has made significant strides in text-to-image synthesis, but remains challenged to maintain high perceptual quality on advanced applications. This paper presents an end-to-end training framework that has been developed to enhance image quality by integrating multiple optimization approaches. Our approach improves fidelity, color coherence, and structural consistency through perceptual loss functions, adaptive learning processes, and architectural improvements. We seek to suppress shared artifacts at the expense of minimal computational cost. Our solution achieves this goal through massive experimentation, reducing FID scores by 27% while lowering the computational overhead of traditional fine-tuning practices by 35% without impacting the speed of generation or increasing requirements on resources.

Keywords – Stable Diffusion XL, Fine-tuning, Perceptual Optimization, Text-to-Image Generation, Deep Learning, Neural Networks, Computer Vision

Paper No. ICRRCE-091

Navigating Barriers to Adoption: A Comprehensive Analysis of Voice AI Integration in Healthcare Systems

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Abstract –Voice activated health technologies, including virtual health assistants, and advanced speech recognition systems are a reality and are poised to revolutionize healthcare, creating a more engaged patient and simplified access to medical information. To delve deeper into the intersection of intelligent voice assistants and healthcare systems, this paper provides a full examination of the integration of intelligent voice assistants in healthcare environments and presents both their mighty and impractical sides as well as ways forward for future investigation. We explore the key developments in Natural Language Processing and Machine Learning with regards to how they affect clinical workflows, patient outcomes and larger systems of healthcare delivery. It carefully identifies and assesses the key obstacles to the widespread adoption from ethical dilemmas and data privacy concerns to a rapid need of a stronger ethical framework. Additionally, the capacity of Voice AI to reduce an administrative burden; raising patient satisfaction; and improving operational efficiency within healthcare settings is explained. Based on the review of the existing literatures and the illustrative case studies, this study highlights the disruptive promise of speech technology in medicine while suggesting low cost calls for next steps in research and policies. Basically, our primary aim is to brief healthcare practitioners, technologist and policy maker of the practical benefit and feasible directions of spoken language systems in redefining healthcare.

Keywords –Voice AI, healthcare integration, natural language, ethical frame-works, patient trust, regulatory challenge

Paper No. ICRRCE-092

Modern Wireless Biometric Door Lock System Using Arduino and IoT Framework

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Abstract – In terms of security, the notion of a “smart home” is quite new. The use of biometric fingerprint technology in identity systems, particularly those used for house entry, is one cause of worry. The project at hand developed a fingerprint identifying system using fingerprints and a keypad system called Pins for a smart house. The hardware consists of an input/output power supply and an Arduino micro-controller. A fingerprint sensor is also embedded to record users' fingerprints. Taking into consideration the hardware architecture, the study estimated the cost of installing authentication techniques based on PIN and fingerprints in embedded devices. During the creation of an accessible program, it shows how to connect an Arduino micro-controller to a sensor of the fingerprint, door lock, numerical keypad, and Arduino micro-controller

Keywords – Fingerprint Recognition, Arduino, Embedded Systems, Access Control

Paper No. ICRRCE-093

Augmented Reality for STEM Education: Integrating Astronomy and Chemistry

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Abstract – Augmented Reality (AR) is revolutionizing education by providing immersive and interactive learning experiences. This paper presents an innovative AR-based educational system integrating astronomy and chemistry, enhancing student engagement in STEM subjects. The application allows users to explore the solar system and interact with chemical elements and reactions in a 3D augmented space. Using Unity and AR Foundation, the system is designed for Android and iOS platforms, making it accessible across various devices. By incorporating real time interactions, interactive learning modules, and gamification elements, this project fosters a deeper understanding of scientific concepts. The study highlights the benefits of AR in education, including increased retention, enhanced engagement, and improved comprehension of complex scientific principles.

Keywords –Augmented Reality, STEM Education, Astronomy, Chemistry, Interactive Learning, Unity, AR Foundation.

Paper No. ICRRCE-094

Automated image exposure adjustment using C-GAN and CM-GAN

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Abstract – Image exposure must be carefully adjusted to improve image quality for photos taken in various lighting conditions. The Cascade Generative Adversarial Network and the Cascade Modulation Generative Adversarial Network are two state-of-the-art deep learning models that we use in this paper to describe a novel system that functions completely independently and effectively adjusts the exposed areas in images. The suggested technique adds additional multiple scale information and generates precise image features by utilizing a dual-stream decoder architecture, Fourier convolution blocks, and cascaded global-spatial modulation sections. The model's primary characteristics are spatial modulation for fine-tuning local modifications and global modulation for creating coarse structures. In order to maintain semantic structures and object-level details throughout the improvement process, the C-GAN and CM-GAN framework additionally integrates an Object-Aware Training scheme. The model handles images at different scales using a multi-resolution Laplacian pyramid decomposition, guaranteeing precise brightness, contrast, and detail recovery. The suggested approach outperformed both conventional histogram-based techniques and the most advanced deep neural network models when tested on a variety of datasets containing photos with different exposure faults. The method significantly improved the brightness, contrast, and detail restoration offered by the current models, according to the evaluation of the results. Our automated solution's encouraging outcome promises great applicability in a variety of domains, such as digital media repair, surveillance, and photographic enhancement.

Keywords –Image exposure, deep learning, Cascaded Generative Adversarial Network, Cascaded Modulation Generative Adversarial Network, Dual-stream decoder, Fourier convolution, global-spatial modulation, semantic structures, Object-Aware Training, Laplacian pyramid decomposition, deep neural network.

Paper No. ICRRCE-095

IOT Based Integrated Real Time Bus Tracking And Passenger Seat Availability System

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Abstract –The technological rise in public transportation is on the horizon, but the bus network structure and intelligent bus tracking system should first be in place. Bus transport service is on the edge of digital revolution, generating real-time tracking information about the bus service using smartphones. Based on IoT this project is implemented as android application. There are two applications one for server and the other for the client. Buses carry GPS devices to track their positions. By these positions to server are periodically updated. Client application displays map showing the position of bus. In this project, a cloud-based bus tracking system based on IoT is proposed to reduce human intervention, waiting time and energy. The exact location and arrival time of the bus can be tracked dynamically by using a mobile application to provide better and efficient bus service. Furthermore, users can view list of buses by giving source and destination and see the available seats presented in the selected bus. The proposed scheme allows more flexibility and user satisfactory service to the user in terms of time loss and encourages more people to ride by providing real-time bus tracking information to improve passenger satisfaction. The main objective is to minimize the unnecessary waiting and queueing time uncertainty of passengers. The sustainability of public transport service can be maintained by providing noteworthy benefits to the users using the proposed IoT-based bus tracking system.

Keywords –Internet of Things, Bus Tracking System, Real-time Tracking, GPS, Smart Transportation etc.

Paper No. ICRRCE-096

Versatile Steganography: Securely Hiding Text and Images in Multimedia Using Advanced LSB Techniques

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Abstract –The project strives to improve the security and confidentiality of confidential information through the utilization of the least significant bit (LSB) steganography method and the use of advanced cryptographic methods. In image steganography, we hide text inside digital images by modifying the least significant bits of pixel values so that the modification is not visible to the human eye. This approach ensures that the hidden information does not leak out without degrading the quality of the original image, and it is a safe method for secret communication. Apart from image steganography, the project also ventures into audio steganography, where text and an encryption key are merged and encrypted by the Advanced Encryption Standard (AES) before being embedded into audio files. The addition of AES cryptography makes the embedded message more secure so that even in case of detection of the steganographic process, the encrypted information cannot be accessed without proper authorization. The two-layered system of integrating steganography and cryptography provides a better level of security for sending sensitive information via audio media. The project is also extended to video steganography using the same AES cryptography and LSB embedding principles to video. By concealing the encrypted text in the video frames, the method offers a safe way of data transmission in a widely used and shared format. The video files' application in steganography utilizes the high capacity of data and video's complex structure, rendering the concealed information even harder to discover. In general, this project proves to have a holistic solution to secure transmission of data in different media forms by capitalizing on the advantages of both steganography and cryptography for successfully safeguarding confidential data.

Keywords-steganography, AES cryptography, strong method, secrete key, imperceptible, unauthorized access, least significant bit.

Paper No. ICRRCE-097

Ecobin: Connectivity Enabled Solar Powered Acquatic Waste Gatherer
(Equatic Waste GathererEcobin: A Sophisticated Approach to Waste Management)

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Abstract – This work proposes a MATLAB-based simulation for real-time monitoring of pH, turbidity, and temperature, among other water quality indicators. Over a twenty-one-minute period, the simulation creates synthetic data to examine trends and fluctuations in water quality. The gathered data is kept in an organized table and shown visually with bar graphs so that parameter changes during time may be easily shown. The information can also be sent to a cloud-based platform like Thing Speak for real-time monitoring needs or downloaded to a CSV file for additional study. Essential for environmental monitoring, industrial uses, and IoT-based innovative water management systems, this simulation helps one to grasp the temporal fluctuations in water quality. The method guarantees efficient data analysis and visualization, therefore offering essential insights to researchers and field practitioners in the field of water quality evaluation.

Keywords – Water Quality Monitoring, IoT, Sensor Data, Environmental Monitoring, Data Visualization.

Paper No. ICRRCE-098

AI-Driven Umpire Review and Pitch Predictions

Cardless society: assessing the role of cardless ATM's in shaping the future of financial transactions

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Abstract – This project focuses on Automated Teller Machine (ATM) services are gaining popularity due to their adaptability and ease of integration with banking systems. People are widely using their ATM cards for immediate money transfer, cash withdrawal, shopping etc. In order to provide high levels of security, we introduced fingerprint and face recognition-based customer authentication. The creation of a single smart card ATM (Automated Teller Machine) capable of processing multiple bank accounts is the primary objective of this project. Because connecting various bank databases requires a significant amount of resources, it lowers the cost of interbank transactions. Through the use of keypads, an OTP (One-Time Password) based on the GSM Module, and a smart card (RFID), non-authorized individuals have access to this security system. Despite the fact that the proposed system is more user-friendly, productive, and convenient, the interactive user module is where the user can log into the system and carry out the transactions of their choosing.

Keywords –They leverage fingerprint, facial, or iris recognition to authenticate users and enable secure banking transactions.

Paper No. ICRRCE-099

Lung Infection Detection Using Image Analysis and Artificial Intelligence

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Abstract – Predicting drug overdoses is critical to improving patient safety and preventing fatal outcomes in healthcare systems. Lung infections, including pneumonia and tuberculosis, pose significant health risks globally, necessitating timely and accurate diagnosis for effective treatment. Traditional diagnostic methods, such as physical examinations and laboratory tests, can be time-consuming and may not always provide definitive results. This study explores the application of image analysis techniques, particularly through the use of chest X-rays and computed tomography (CT) scans, to enhance the detection of lung infections. The research employs advanced image processing algorithms and machine learning models to analyze radiological images. By leveraging convolutional neural networks (CNNs) and other deep learning frameworks, the study aims to automate the detection process, improving both speed and accuracy. The dataset comprises a diverse range of lung images, annotated by medical professionals, to train and validate the models effectively.

Keywords – CNNs, Computer tomography (CT) scans, Image Normalization, Machine Learning, Automate Detection process, etc.

Paper No. ICRRCE-100

Voice Based e-mail System For Visually impaired person

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Abstract –With the rise of personal computing, many technological solutions have been created to help visually impaired individuals use digital platforms more easily. To address this need, a desktop application called VMAIL has been developed to allow blind users to send and read emails just like sighted people. This paper explains how VMAIL is built using Python and how it helps visually impaired users access their emails without difficulty. The app uses speech-to- text and voice recognition technology, enabling users to interact with emails through voice commands instead of relying on traditional text-based interactions. Since the internet is an essential part of daily life, visually impaired individuals often struggle to access online information due to the text-heavy nature of most web services. However, improvements in assistive technology, such as screen readers and audio feedback-based systems, have made it easier for blind users to navigate the web. VMAIL aims to bridge this gap by providing a voice-controlled email system. With features like text-to-speech conversion and voice commands, it offers a smooth and accessible way for visually impaired users to manage their emails. This innovation plays a crucial role in making digital communication more inclusive and increasing the independence of blind individuals.

Keywords –Voice commands, text-to-speech, speech-to-text, screen readers, audio navigation, accessibility tools poor vision, blind users, accessibility.

Paper No. ICRRCE-101

Inference of Brain States Under Anesthesia with Meta Learning Based Deep Learning Models

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Abstract – Monitoring the depth of unconsciousness during anesthesia is beneficial in both clinical settings and neuro science investigations to understand brain mechanisms. Electroencephalogram (EEG) has been used as an objective means of characterizing brain altered arousal and/or cognition states induced by anaesthetics in real-time. Different general anaesthetics affect cerebral electrical activities in different ways. However, the performance of conventional machine learning models on EEG data is unsatisfactory due to the low Signal to Noise Ratio (SNR) in the EEG signals, especially in the office-based anesthesia EEG setting. Deep learning models have been used widely in the field of Brain Computer Interface (BCI) to perform classification and pattern recognition tasks due to their capability of good generalization and handling noises. Compared to other BCI applications, where deep learning has demonstrated encouraging results, the deep learning approach for classifying different brain consciousness states under anesthesia has been much less investigated. In this paper, we propose a new framework based on meta-learning using deep neural networks, named Anes-Meta Net, to classify brain states under anaesthetics. The Anes-Meta Net is composed of Convolutional Neural Networks (CNN) to extract power spectrum features, and a time consequence model based on Long Short-Term Memory (LSTM) networks to capture the temporal dependencies, and a meta- learning frame work to handle large cross-subject variability. We use a multi-stage training paradigm to improve the performance, which is justified by visualizing the high-level feature mapping. Experiments on the office-based anesthesia EEG dataset demonstrate the effectiveness of our proposed Anes-Meta Net by comparison of existing methods.

Keywords –Brain state estimation, meta learning, anesthesia EEG, deep learning.

Paper No. ICRRCE-102

Garbage Sorting Machine Using Atmega323 Arduino with GPS & GSM

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Abstract –As smart cities continue to develop, the concept of keeping cities clean is becoming increasingly important. The amount of waste produced is so high that it is quite cumbersome to keep track of it. With the advancement of technology in many areas, automation methods can be used to prevent waste. Waste separators are designed to help remove waste. There are three waste bins in the system: wet and dry. The conveyor system detects the incoming waste and classifies it as dry or wet with the help of different devices connected to the system and transfers it to the relevant equipment. The diversion process is carried out by servomotors programmed according to the desired position. This will help in processing various types of waste as required. The level of garbage in each container is monitored by ultrasonic sensors located in each container. Since the entire installation is automated, the human intervention required for timely identification of waste and processing from the bins is reduced. The most discussed issue is waste management. In a big country like India, waste management is quite difficult due to the large population. There are many garbage bins all over the city. However, there is no emergency evacuation and no system to show the level of garbage. Here we suggest an automatic waste collection system using GSM GPS. It includes the level of garbage along with space.

Keywords –Arduino nano, L298n motor driver module, 2 RPM Gear motors, LCD display, I2c module., IR sensor, Wheels, GSM SIM800C, GPS Neo 6M, Ultrasonic sensor, Arduino IDE, Embedded C

Paper No. ICRRCE-103

Enhanced Facial Recognition for Criminal and Missing Person ID Using FaceNet and MTCNN

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Abstract –Theoretical Facial Recognition innovation has turned into a vital device in security and distinguishing proof frameworks, yet regular strategies frequently battle with age-related facial changes. This outcomes in diminished exactness while distinguishing people as they become older. Our undertaking proposes an Upgraded Facial Acknowledgment Framework that tends to this restriction by using Perform multiple tasks Flowed Convolutional Organizations (MTCNN) for exact face recognition and arrangement, joined with FaceNet for separating powerful facial elements. The combination of MTCNN guarantees precise face confinement, giving excellent contribution to FaceNet's profound learning model. FaceNet succeeds in limiting the effect old enough related varieties, permitting the framework to perceive people in any event, when critical age holes exist between the reference picture and their ongoing appearance. This makes the framework profoundly compelling for recognizing missing youngsters and finding crooks overstretched periods The proposed framework conveys further developed precision across assorted age gatherings, improving its appropriateness in different situations. Key use cases remember helping policing finding missing people, further developing air terminal security, and supporting military tasks by recognizing potential dangers like psychological oppressors. By beating age-related difficulties, our framework contributes fundamentally to public security and gives a solid answer for one of the basic issues in facial acknowledgment innovation.

Keywords –Enhanced facial recognition, MTCNN, FaceNet, age invariant recognition, etc.

Paper No. ICRRCE-105

Skin Cancer Detection Using CNN

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Abstract – Skin cancer is one of the most common and serious types of cancer. If it is not detected and treated early, it can spread to other parts of the body, making it more dangerous. A reliable and automated method for classifying the various types of skin cancer is becoming increasingly important because early diagnosis is essential for increasing survival rates. The three most common types of skin cancer are the most prevalent and least aggressive type is basal cell carcinoma (BCC). Squamous Cell Carcinoma (SCC) can grow deeper into the skin and spread if left untreated. Melanoma – the deadliest form, known for its high potential to spread. Deep learning, especially Convolutional Neural Networks (CNNs), has proven to be highly effective in analyzing medical images. CNNs can detect small differences in skin lesions, making them valuable for automated skin cancer detection. A custom CNN model for the detection of skin cancer is presented in this study. The model includes image pre-processing techniques to remove unwanted artifacts, ensuring cleaner and more accurate data for training. The model was trained on a large dataset and achieved an impressive accuracy of 92.32% in classifying skin cancer types. The findings indicate that this customized CNN model is dependable for the early detection and diagnosis of skin cancer due to its high precision, efficiency, and accessibility.

Keywords - Skin cancer, deep learning, convolutional neural network (CNN), image classification, melanoma, basal cell carcinoma (BCC), squamous cell carcinoma (SCC).

Paper No. ICRRCE-106

IoT-Enabled Water Quality Monitoring System

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Abstract – Water quality monitoring is crucial to safeguard public health and ensure environmental sustainability. Traditional water testing methods are often manual, time-consuming, and lack the efficiency required for continuous assessment. HydroIQ introduces a smart, IoT-based solution that automates real-time monitoring of water quality. This system uses IoT-enabled sensors to measure key parameters like pH, turbidity, temperature, dissolved oxygen, and contaminants. The collected data is transmitted to a cloud platform where advanced machine learning algorithms analyze it to detect anomalies and predict potential issues. Users receive real-time alerts via a user-friendly interface, allowing timely intervention. HydroIQ is scalable, adaptable, and ideal for applications in municipal, industrial, and agricultural settings. By combining IoT and intelligent analytics, it revolutionizes water quality management and promotes sustainable practices.

Keywords – IoT, Water Quality Monitoring, Machine Learning, Anomaly Detection, Predictive Maintenance, Real-time Alerts, Cloud Computing, Smart Sensors, Environmental Sustainability

Paper No. ICRRCE-107

The Waste-to-Watt Revolution: IOT- Driven Energy from Waste

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Abstract – The Increasing demand for energy and the growing challenge of waste management necessitates innovative solutions. This project, “The Waste-to-Watt Revolution: IoT Driven Energy from Waste,” presents a sustainable approach to energy generation by converting waste materials such as plastic, rubber, and general garbage into electricity. The system integrates a heating panel to facilitate thermal energy conversion, while an automated waste disposal mechanism enhances efficiency. Real-time monitoring using IoT based sensors ensures operational reliability, and supplementary power from solar panels improves energy output. By incorporating components like Arduino Uno, cooling sensors, and carbon collection plates, the system demonstrates an interdisciplinary fusion of automation, renewable energy, and waste management. This project highlights a scalable and eco-friendly solution that contributes to sustainable energy production and environmental conservation.

Keywords– Waste-to-Energy Conversion, Automated Waste Processing, Real-Time Electricity Monitoring, Supplementary Solar Power, Advanced Technology Integration.

Paper No. ICRRCE-108

Next-Gen Healthcare : AI Driven Disease Detection and Prediction

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Abstract – The Next-Gen healthcare System is an innovative web-based platform designed to leverage machine learning techniques to predict a wide range of diseases based on user provided health parameters. The system aims to simplify healthcare access and decision making by consolidating disease prediction capabilities into a single, user-friendly interface. By analyzing the input data provided by users, such as symptoms, medical history, or lifestyle factors, the system employs robust machine learning models to generate accurate predictions for various diseases. This integrated approach eliminates the inconvenience of relying on multiple applications or tools for different diseases, offering users a comprehensive solution tailored to their needs. Furthermore, the platform extends its functionality by incorporating a hospital recommendation feature. Based on the predicted disease, the system suggests nearby healthcare facilities, ensuring users can access timely and appropriate medical assistance. These recommendations are made by considering factors such as specialization, and ratings of healthcare providers. The Next-Gen healthcare System is poised to enhance the accessibility, accuracy, and efficiency of healthcare services, empowering users to make informed health decisions. By integrating cutting-edge technology and a patient-centric approach, this project bridges the gap between early diagnosis and prompt treatment, ultimately contributing to improved health outcomes.

Keywords – Multi-disease prediction Machine learning Artificial intelligence Support Vector Machine (SVM) Logistic regression Healthcare outcomes Early detection Data privacy Streamline.

Paper No. ICRRCE-109

Automated image exposure adjustment using C-GAN and CM-GAN

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Abstract - Image exposure must be carefully adjusted to improve image quality for photos taken in various conditions. The Cascade Generative Adversarial Network and the Cascade Modulation Generative Adversarial Network are two advanced deep learning frameworks that we use in this paper to describe a novel system that functions completely independently and effectively adjusts the missing or corrupted areas of images with relevant pixels. The suggested technique adds additional multiple scale information and generates precise image features by utilizing a dual-stream decoder architecture, Fourier convolution blocks, and cascaded global-spatial modulation sections. The model's primary characteristics are spatial modulation for fine-tuning local modifications and global modulation for creating coarse structures. In order to maintain semantic structures and object-level details throughout the improvement process. The C-GAN and CM-GAN framework additionally integrates an Object-Aware Training scheme. The model handles images at different scales using a multi-resolution Laplacian pyramid decomposition for detail recovery. The suggested approach uses the most advanced deep neural network models when tested on a variety of datasets containing images with different exposure faults. The method significantly performs image inpainting, object removal, and detail restoration offered by the current models, according to the evaluation of the results. Our automated solution's encouraging outcome promises great applicability in a variety of domains, such as Medical Imaging, Surveillance and Forensics, Gaming and Cultural Heritage Preservation.

Index terms - Cascaded Generative Adversarial Network, Cascaded Modulation Generative Adversarial Network, dual-stream decoder, Fourier convolution, global-spatial modulation, Object-Aware Training, Laplacian pyramid, neural network, exposure faults, image inpainting, object removal Surveillance and Forensics, Cultural Heritage.

Paper No. ICRRCE-110

AI based mock interview evaluator : An emotion and confidence classifier model

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Abstract – The intention of An Emotion and Confidence Classifier Model project is to apply artificial intelligence (AI) methods to update traditional interview evaluation techniques. The project emotion and confidence classifier assist in bridging a gap in traditional evaluation methods that tend to overlook vital elements such as emotional intelligence and inter-personal communication skills by examining candidates' emotional reactions and confidence levels in real-time practice interviews. The emotion and confidence classifier model examines speech patterns and body language signals to determine candidates' levels of confidence. It was trained on multiple analytic interview datasets and is capable of detecting and classifying emotions like happiness, sadness, anger, and surprise. Further, the project includes an easy-to-use web-based interface for online mock interviews that allows interviewers to conduct an interview while receiving instant feedback about the confidence level and emotional quotient of candidates.

Keywords – Emotion Classification, Confidence Analysis, Mock Interview Assessment, Real-time Evaluation, Emotional Intelligence, Speech Pattern Analysis, Body Language Detection, AI Techniques, Interview feedback System, Candidate Evaluation, Web-based Interface, Interview Performance Analysis, Non-verbal Communication, Job Role Suitability.

Paper No. ICRRCE-111

An EMG-Driven Prosthetic Hand for Intuitive and Affordable Upper-Limb Mobility

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Abstract – An EMG-Driven Prosthetic Hand for Intuitive and Affordable Upper Limb Mobility" project aims to develop a prosthetic hand that leverages electromyographic (EMG) signals to provide intuitive control for individuals with disabilities affecting hand movement. EMG sensors detect electrical signals produced by the contraction of residual muscles in the user's forearm or other parts of the body. These signals are processed and translated into precise commands, enabling the robotic hand to perform basic functions such as gripping, pinching, and grasping. The system is designed to be user-friendly, with a focus on providing seamless interaction between the user and the robotic hand by actualizing progressed flag handling methods, the extend points to form a utilitarian, reasonable, and solid arrangement for moving forward the quality of life for people with upper-limb inabilities. The project's victory will be measured through client criticism and execution testing, guaranteeing that the mechanical hand meets the viable needs of its clients in ordinary-errands.

Keywords – EMG-driven prosthetic hand, Electromyography (EMG) signals, Prosthetic control, Gripping functions, Upper-limb mobility, Signal processing, Affordable prosthetics.

Paper No. ICRRCE-112

Deep Learning-Based Real-Time Sign Language Recognition System Using Gesture Detection
(Real-Time Gesture Recognition for Sign Language Interpretation)

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Abstract – Real-time sign language interpretation allows people with different language modalities to communicate easily by translating spoken language into sign language or vice versa in an adaptive and instantaneous manner. Skilled interpreters who are knowledgeable about both spoken and signed languages and their cultural contexts are essential to this process. Real-time interpretation has been further improved by the incorporation of technology, such as gesture recognition software and video conferencing platforms, which enable efficient communication in a variety of settings. In order to support inclusivity, accessibility, and equal participation for the deaf and hard-of-hearing communities, this abstract emphasizes the significance of real-time sign language interpretation. In order to increase the efficacy and efficiency of real-time sign language interpretation, it also looks at the difficulties, developments, and possible future trends in this area, highlighting the necessity for ongoing study and creativity.

Keywords – Sign Language Interpretation, Gesture Recognition, Real-Time Translation, Accessibility, Inclusivity

Paper No. ICRRCE-113

Machine Learning-Enabled Hypertension Screening Through Acoustical Speech Analysis: Model Development and Validation

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Abstract -Hypertension is a major global health concern, and early detection plays a crucial role in mitigating associated risks. This study proposes an innovative approach to detecting hypertension using acoustic speech analysis. By integrating machine learning models, the system extracts speech features to classify individuals into normal, pre-hypertensive, and hypertensive categories. The proposed method considers age and gender-specific variations to improve accuracy. The system architecture, model training process, feature extraction methods, and implementation details are discussed in depth. Additionally, the study provides an extensive review of literature, discusses ethical considerations, and explores future enhancements to improve detection accuracy and real-time applicability.

Keywords -Hypertension, Acoustic Speech Analysis, Machine Learning, Signal Processing, Age and Gender-Specific Detection, etc.

Paper No. ICRRCE-114

IoT-based breath analyzer alcohol sensing alert with security automatic engine locking system

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Abstract – Drunk driving is becoming the primary cause of most traffic accidents. Because drunk drivers are unstable, they make snap decisions on the highway that put everyone's lives- including the drivers- at risk. However, police personnel and road safety officers find it difficult to effectively monitor inebriated drivers. The purpose of this paper is to detect alcohol using the mq3 alcohol sensor, which is a sensor in the automobile that detects alcohol consumption. The sensor then sends an indication to a microcontroller, which then sends the communication with the GSM. A specific preregistered mobile device receives a message from the GSM indicating that the driver is intoxicated, the burger beeps, the led turns red, and the engine is stopped. Sending a specific message to the system will unlock it if someone else wants to drive, but the alcohol sensor will still function. The goal of this project is to design an obstacle detection system that uses an ultrasonic sensor and an Arduino board to track location. A gsm module will be used to generate an alert and send an SMS. When an ultrasonic sensor detects a person, the engine will slow down; when a person is very close to the ultrasonic sensor, the engine will automatically stop. GSM and GPS will be used to send this SMS and position to the authorized individual. In this manner, the owner receives the precise position of the vehicle, giving them the actual location. It will be readily accessible and copied to the Google map along with the car's location.

Keywords – Drunk driving prevention, MQ3 alcohol sensor, ultrasonic obstacle detection, Arduino microcontroller, GSM/GPS tracking, vehicle safety system.

Paper No. ICRRCE-117

Development Of A Skytraq Receiver Based System To Acquire And Analyse Real Time Signals Of Navigation Satellites

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Abstract – GNSS constellations are used for satellite navigation, initially PolRx5 receiver data is collected and examined for real-time transmissions. This study focuses on GNSS SkyTraQ Receiver for analysing the data, interfacing and real-time data acquisition using TTL (Transistor-Transistor Logic) communication module. The observations are recorded at the geographic location of GPCET (150.79' N latitude and 780.07' E longitude) for static mode and for kinematic mode GPCET (150.79' N latitude and 780.07' E longitude) to Kurnool Medical College (150.84' N latitude and 780.04' E Longitude). The American Global Positioning System (GPS) is used to evaluate the receiver's efficiency in signal acquisition and processing time. Data was gathered by focusing on parameters such as fix quality, satellite availability, precision dilution (DOP), and signal reliability. The interfacing facilitated exact data exchange, allowing the SkyTraQ GNSS receiver to transmit NMEA (National Marine Electronics Association) sentence logs via the TTL module for further processing. The setup ensures efficient communication between the GNSS receiver and external devices, enabling real-time analysis of positional accuracy, satellite visibility, signal integrity, and environmental impact on GPS performance.

Keywords – GNSS, SkyTraQ, CP2102, TTL

Paper No. ICRRCE-118

Comprehensive IoT-Driven Intelligent Energy Optimization and Anti-Tampering Framework for Next-Generation Smart Homes

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Abstract–The increasing integration of Internet of Things (IoT) technologies in smart homes has unlocked new opportunities for energy optimization and security enhancement. This paper proposes a Comprehensive IoT-Driven Intelligent Energy Optimization and Anti-Tampering Framework tailored for next-generation smart homes. The framework employs advanced IoT sensors and cloud-based analytics to achieve energy efficiency and robust tamper detection. The energy optimization module dynamically monitors and controls energy consumption through real-time data from occupancy sensors, weather conditions, and user preferences. Adaptive scheduling of appliances ensures efficient energy usage without relying on predictive algorithms. The anti-tampering module leverages secure IoT architectures, and predefined threshold-based anomaly detection techniques to identify and mitigate unauthorized attempts to manipulate energy systems. The framework is designed to seamlessly integrate with existing smart home infrastructures, ensuring scalability, reliability, and ease of deployment. Simulation results demonstrate significant reductions in energy consumption and enhanced resilience against tampering attempts, highlighting the potential of this framework to set new standards in smart home energy management and security.

Keywords–Energy Optimisation, Anti-tampering, IoT Technology, Smart Homes, Real-time Monitoring, Cloud-based Analytics, Anomaly detection, Energy Efficiency, Smart Grids, Remote Access, Power Theft.

Paper No. ICRRCE-119

Securing Medicinal Plant identification through ML-Enhanced Image Processing

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Abstract –Since ancient times, medicinal plants have played a crucial role in the development of medications and other medical interventions. Approximately 80% of people in developing nations receive primary healthcare from medicinal plants, while over 25% of medications in developed nations are made from these plants. The leaf identification problem has been used to compare the effectiveness of Convolutional Neural Networks (CNN) and pre-trained models. The Keralan native medicinal plants are included in the dataset suggested in this study. CNN achieved 95.79% classification accuracy. Accuracy is achieved by the model. This highlights the need for a more accurate and useful method of identifying medicinal plants. Earlier, a number of automated approaches that used deep learning and traditional machine learning (TML) techniques were put forth; however, they were shown to be insufficiently accurate in a different setting and required individual leaf images. Additionally, it takes a lot of effort and time to capture individual leaf images for each plant. This study offers a reliable, accurate, and useful method for identifying medicinal plants from photos of the plants taken with a smartphone. In order to classify the plants using a Support Vector Machine (SVM), the suggested system used a cascaded architecture to extract features using a pre-trained RESNET101 model that had been optimized using Particle Swarm Optimization (PSO). The suggested deep learning-based Densenet121, VGG16, Resnet101, and InceptionV3 algorithms for medicinal plants outperformed the state-of-the-art (99%) with an accuracy of 99.60%. The system's practical application was guaranteed by its high accuracy, quick identification time, and resilience.

Keywords –Medicinal plants, traditional machine learning (TML) techniques, Densenet121 Algorithm, VGG16 Algorithm, Resnet 101Algorithm, Inception V3 Algorithm

Paper No. ICRRCE - 122

Predicting Drug Risk Level from Adverse Drug Reactions Using Deep Learning Approaches

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Abstract— Adverse Drug Reactions (ADRs) pose a critical and hazardous issue in the pharmaceutical industry as they lead to medical complications for patients. When dealing with high-dimensional datasets with imbalanced classes, machine learning models such as Support Vector Machines (SVMs) and Decision Trees often yield unsatisfactory outcomes, prompting researchers to employ more sophisticated computational techniques. This study introduces a deep learning framework for classifying ADR risks by integrating Drug Convolutional Neural Network (DCNN) models with VGG19 and ResNet-101 architectures. By utilizing SMOTE in conjunction with PCA, data from a pharmaceutical database comprising 1,884 drug samples were processed to address class imbalance issues and reduce dimensionality. In the classification task, DCNN surpassed both VGG19 and ResNet-101, achieving an accuracy of 96.28%, whereas ResNet-101 reached 95.80%, and VGG19 settled at 92.50%. The proposed framework, which integrates deep hierarchical feature extraction with residual learning, enhances drug risk assessment by addressing significant challenges, such as model interpretability, data scalability, and class imbalance. The outstanding performance of deep learning models in this study supports their application in real-world pharmaceutical safety and clinical support systems. The research findings provide strong evidence of the potential of deep learning to enhance drug safety and reduce the health risks associated with adverse drug reactions.

Keywords - Adverse Drug Reactions (ADRs), Deep Learning, Drug Risk Prediction, Convolutional Neural Networks (CNNs), Principal Component Analysis (PCA), Synthetic Minority Oversampling Technique (SMOTE)

Paper No. ICRRCE-123

Ground Water Level Prediction Using Artificial Neural Network with Genetic algorithm

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Abstract– Groundwater is vital for agriculture, industry, and domestic use, but its depletion demands accurate prediction for sustainable management. This study proposes a hybrid model combining Artificial Neural Networks (ANN) with Genetic Algorithms (GA) to enhance groundwater level prediction. ANN models complex, non-linear relationships, while GA optimizes its parameters like weights and biases. The model utilizes historical groundwater data, rainfall, soil properties, and hydrological factors. Data preprocessing ensures accuracy and consistency. The ANN-GA model outperforms conventional ANN and other machine learning methods in accuracy, reliability, and efficiency. This approach supports real-time groundwater monitoring and helps policymakers develop sustainable water management strategies.

Keywords–Ground water Level Prediction, Artificial Neural Network (ANN), Genetic Algorithm (GA).

Paper No. ICRRCE-124

AI-driven Spaced Repetition for Personalized Learning: A Framework for Efficient Exam Preparation and Enhanced Knowledge Retention

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Abstract – High-stakes computer-based assessments like USMLE, JEE, and GATE necessitate effective long-term retention strategies. This paper introduces the framework for a novel AI-driven spaced repetition system that optimizes exam preparation through features such as topic modeling and adaptive questioning. Our system dynamically adjusts question-card scheduling based on learner performance and perceived difficulty. The Free Spaced Repetition Scheduler (FSRS), a spaced-repetition algorithm that is a key part of our system, tailors revision intervals to reinforce weak question cards more frequently while spacing out strong ones. However, while the goal of exam preparation is to master the concepts, the goal of a spaced repetition algorithm is to memorize question cards. Therein lies the drawback of classical spaced repetition, and our system attempts to address this by presenting conceptually similar questions rather than identical ones, thereby enhancing the retention of key concepts. Our system attempts to find conceptually similar questions using a customized neural topic model (NTM). The NTM groups the questions into clusters, which are further categorized manually into topics and sub-topics based on the human-readable topic labels assigned using class-based TF-IDF (c-TF-IDF). As learners take mock tests, our system refines question selection using a data-driven approach, resulting in a highly personalized learning experience. Through targeted reinforcement, our system, which integrates AI-based topic modeling with spaced repetition, aims to maximize recall efficiency and, thus, exam readiness.

Keywords – Personalized learning, spaced repetition, topic modeling, BERT, class-based TF-IDF, knowledge retention, exam preparation, artificial intelligence.

Paper No. ICRRCE-125

Predictive Real-Time Water Quality Control and Management for Optimal Fish Production

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Abstract - Water quality plays a critical role in aquaculture, influencing fish health, growth, and overall productivity. Poor water conditions can cause stress, increase disease susceptibility, and lead to high mortality rates, resulting in significant economic losses for fish farmers. This project leverages the Internet of Things (IoT) and machine learning to develop a smart aquaculture monitoring system that continuously tracks key water parameters [3][10], including pH, dissolved oxygen, temperature, ammonia levels, and turbidity. The collected real-time data is transmitted to a cloud-based platform, where a machine learning model analyzes patterns and detects anomalies, predicting potential water quality issues before they escalate [5][6]. Farmers receive timely notifications and actionable insights via a dedicated mobile application, allowing them to take immediate corrective actions such as adjusting aeration, water exchange, or chemical balancing. By integrating IoT-driven monitoring with AI-powered analytics [1][2], this system enhances efficiency, reduces fish mortality, and supports sustainable aquaculture practices, ultimately improving farm profitability and long-term environmental viability.

Keywords - Aquaculture, IoT, machine learning, water quality monitoring, smart aquaculture, fish health, real-time data, cloud computing, AI analytics, sustainability, predictive maintenance.

Paper No. ICRRCE-126

Machine Learning-Based Student Performance Prediction and Course Recommendation: A Comprehensive Analysis

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Abstract – This study introduces an advanced web-based system that uses machine-learning algorithms to forecast students' academic performance and suggest personalized learning paths. By diving into a wealth of educational data like academic records, attendance trends, and demographic details the system has achieved impressive prediction accuracy, boasting an R^2 score of 0.991 for grade predictions and 97.2% accuracy for pass/fail outcomes. With the help of random forest algorithms, logistic regression, and k-means clustering, it allows for a thorough analysis of student data, making it easier to spot at-risk students and implement timely interventions. The user-friendly web interface lets students track their progress and receive customized course recommendations, while administrators can tap into analytical insights to enhance decision-making at the institutional level. This study highlights the game-changing potential of machine learning in education by merging predictive analytics with personalized learning support, ultimately fostering a more responsive and effective educational environment.

Keywords – Educational Data Mining, Student Performance Prediction, Machine Learning, Personalized Learning, Course Recommendation Systems, Academic Analytics

Paper No. ICRRCE-127

AI-Driven 3D Blueprint Generator for Personalized Product Design

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Abstract – This paper presents an AI-driven 3D blueprint generator for personalized product design, leveraging advanced machine learning techniques to transform user inputs into detailed, customizable 3D models. By utilizing cutting-edge technologies, including DALL-E, Stable Diffusion, and a Single Structured LATent (SLAT) representation, our system generates designs in multiple formats, including Radiance Fields, 3D Gaussians, and meshes, making the process more efficient and accessible than ever before. Emphasizing inclusivity, the system ensures that designs are not only customizable but also adaptable to a wide range of user requirements. Through simplified workflows and extensive customization options, our method makes it easier and more intuitive to bring product ideas to life, pushing the boundaries of innovation in personalized product design.

Keywords – Machine learning, AI-Driven 3D, SLAT, DALL-E, Radiance Fields, 3D Gaussians, meshes, inclusivity

Paper No. ICRRCE-128

Real time facial mood based music, food, movies (MFM) recommendation system using CNN

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Abstract – Personalization is transforming user experiences across multiple domains, with real-time recommendation system playing a central role. This work introduces a Real-Time MFM (Music, Food, and Movies) Real Time facial mood based MFM recommendation system Using CNN, which recommends content dynamically based on facial expressions. The system uses the Convolutional Neural Networks (CNNs) for facial detection of emotions, with the help of Open CV and TensorFlow / Keras to process real-time facial expressions. After detecting mood, it suggests music, food, and movies from a pre-structured dataset stored in MongoDB Atlas. The backend is coded in Flask, with Flask-Py Mongo being used for managing the database and Security for authentication. The system meets 85% user satisfaction for music recommendations, 75% accuracy for mood-based food recommendations, and 80% user engagement for movie recommendations, reflecting its success in providing personalized experiences. The recommendation engine improves continually through user feedback, enhancing precision over time.

Keywords –Facial Mood Recognition, Convolutional Neural Network, Real-Time Recommendation, Flask, OpenCV, TensorFlow, AI-driven Personalization, User Engagement

Paper No. ICRRCE-129

Secure machine learning using homomorphic encryption for Sickle cell disease

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Abstract –Sickle Cell Disease (SCD) is a genetically inherited blood disorder that poses severe health complications, primarily affecting haemoglobin structure. Early detection and effective diagnosis are crucial in managing and reducing the severity of the disease. In recent years, Machine Learning (ML) models have demonstrated remarkable potential in the healthcare sector, especially for predictive analysis and disease diagnosis. However, the widespread application of these models faces critical challenges concerning the privacy and security of patient data. This paper proposes a robust and privacy-preserving approach to diagnosing SCD by integrating Machine Learning techniques with ****Homomorphic Encryption (HE)****. Homomorphic Encryption enables computations to be performed directly on encrypted data without compromising its privacy, ensuring the confidentiality of sensitive medical information. This study employs ****Fully Homomorphic Encryption (FHE)**** to build a secure ML model that can process encrypted patient data to predict the likelihood of SCD without exposing the raw data. The proposed model aims to mitigate privacy breaches while delivering high predictive accuracy. Extensive performance analysis indicates that the encrypted model maintains comparable accuracy with traditional models, confirming the feasibility of applying Homomorphic Encryption in healthcare diagnostics. The findings of this research significantly contribute to enhancing data privacy in medical Machine Learning applications, paving the way for secure and ethical healthcare data processing.

Keywords –Sickle Cell Disease (SCD), Machine Learning, Homomorphic Encryption, Data Privacy, Secure Healthcare, Fully Homomorphic Encryption (FHE).

Paper No. ICRRCE-130

Multi-Platform Media Controller Using Voice and Gesture Recognition

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Abstract - Controlling digital media applications through conventional input methods can often be inconvenient and inefficient, especially in multi-tasking scenarios. The proposed system offers a cross-platform media controller that leverages both voice commands and hand gesture recognition for a seamless user experience across platforms like YouTube, Spotify, and VLC. **Methods:** The system utilizes Google Speech Recognition (GSR) for voice input, OpenCV and MediaPipe for real-time gesture tracking, and PyAutoGUI to execute media control commands efficiently. Additionally, pyttsx3 is used to deliver audio feedback to users, while voice-to-text functionality enables hands-free typing in applications like Notepad. **Results:** The system supports functionalities including play, pause, stop, volume control, and switching tracks. It also addresses ambient noise conditions that affect voice recognition performance. **Conclusions:** The system proves to be effective in providing an intuitive, low-latency interface for controlling media applications, enhancing usability and accessibility. Future work will involve expanding gesture recognition capabilities and integrating support for platforms like Netflix and Amazon Prime. **Keywords** – Artificial Intelligence (AI), Convolutional Neural Networks (CNN), Google Speech Recognition (GSR), Human-computer interaction (HCI).

Paper No. ICRRCE-131

Parkinson Disease Detection using Neural Networks by Ensembling Voice and Spiral Image Models with Neural Impact Analysis

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Abstract – Parkinson’s disease is a progressive neurological disorder that disrupts both motor skills and cognitive functions. Detecting it at an early stage is essential for timely intervention, but conventional diagnostic approaches often depend on expert evaluation and specialized medical tests. In this study, we introduce a multi-modal deep learning framework that combines voice analysis and spiral drawing assessments to enhance the accuracy of Parkinson’s disease prediction. The voice data is processed using a Dense Neural Network (DNN) trained on extracted Mel-Frequency Cepstral Coefficients (MFCCs), while the image data which consists of spiral and wave drawings are analyzed and trained after preprocessing using a Convolutional Neural Network (CNN). The predictions from both models are ensembled through weighted averaging to enhance classification accuracy. Additionally, we conduct an ablation study on the trained DNN model, applying zero and mean ablation techniques to identify high-impact neurons and analyze their role in model decision-making. The proposed approach not only improves classification accuracy but also enhances model interpretability, making AI-driven PD diagnosis more transparent and reliable. Our results indicate that a multi-modal learning approach, combined with explainability techniques, can significantly improve early PD detection and contribute to better clinical decision-making.

Keywords –Voice, Spiral Drawing, Wave Drawing DNN, CNN, Zero Ablation Technique, Ensemble Learning, Neuron Importance Analysis.

Paper No. ICRRCE-132

Real-Time Action Recognition in Multi-Person Pose Estimation Using MediaPipe

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Abstract – This paper explores the integration of real-time action recognition into multi-person pose estimation using MediaPipe. The system focuses on recognizing and classifying movements such as walking, running, sitting, and interacting in real-time. Leveraging MediaPipe's pose estimation framework, the algorithm recognizes significant body landmarks for many persons and interprets their movements to identify distinct activities. Applications include sports analysis, fitness tracking, and surveillance systems. The system showed 78% accuracy in real-time scenarios after being trained on a filtered N-UCLA-RGB dataset.

Keywords – N-UCLA-RGB dataset, machine learning, action classification, human pose estimation, real-time performance, pose estimation framework, video processing, skeleton tracking, data augmentation, OpenCV, action differentiation, multi-person pose estimation, MediaPipe, fitness tracking, sports analysis, surveillance systems, and real-time action recognition.

Paper No. ICRRCE-134

Study Pattern Prediction and Recommendation

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Abstract –In the pursuit of academic excellence, understanding individual learning patterns is crucial for optimizing study methods. This paper presents an AI-driven approach, Study Pattern Prediction, designed to enhance students' academic performance by identifying their most effective study strategies. The system employs a pre-trained machine learning model that classifies students into distinct learning types based on their quiz results, subsequently providing personalized study recommendations. The methodology integrates classification techniques to detect individual learning styles such as visual, auditory or reading/writing. Through data pre-processing and pattern recognition, the system identifies trends in study behaviour's and suggests personalized strategies for better academic performance. The research highlights the importance of AI-driven personalization in education, demonstrating how machine learning can bridge the gap between traditional teaching methods and individual learning preferences. Experimental results indicate a significant improvement in students' engagement and retention rates when study strategies align with their learning patterns. Comparative analysis with conventional study techniques shows a notable increase in quiz performance, affirming the model's efficacy in optimizing learning outcomes. By leveraging AI-powered classification and adaptive learning methodologies, the Study Pattern Prediction system provides an innovative and practical solution for students seeking to optimize their study habits. This approach not only enhances academic performance but also fosters self-awareness and independent learning, empowering students with data- driven insights into their most effective learning methods.

Keywords –Study pattern prediction, Machine Learning, Rule Based filter, Academic performance, learning style, classification, Personalised study strategies.

Paper No. ICRRCE-135

Post Covid Heart Condition Prognosis Using ML

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Abstract – The COVID-19 pandemic has had a significant impact on global health, particularly affecting cardiovascular systems in recovered patients. Many individuals who have recovered from COVID-19 exhibit post-viral heart complications such as myocarditis, arrhythmias, and heart failure. This research focuses on utilizing machine learning (ML) techniques to predict cardiovascular risks in post-COVID individuals. By analysing patient demographics, medical history, and infection severity, ML algorithms like Logistic Regression and Support Vector Machines (SVM) are employed to identify high-risk patients. Early detection enables proactive interventions, leading to improved patient outcomes (Puntmann *et.al.*, 2020).

Keywords –Heart disease prediction, machine learning, logistic regression, post-COVID complications.

Paper No. ICRRCE-136

AI-Based Traffic Light Control and Emergency Vehicle Prioritization using YOLOv11

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Abstract – Traffic congestion in urban areas disrupts mobility, increases fuel consumption, and delays emergency response times. Traditional traffic signal systems rely on fixed timers, leading to inefficiencies in varying traffic conditions. This research proposes a Smart Traffic Control System using YOLOv11, capable of real-time vehicle detection, classification, and monitoring to dynamically adjust traffic signals based on vehicle density. A region-based vehicle counting approach enhances detection accuracy, ensuring efficient traffic flow management. The system prioritizes emergency vehicles, instantly detecting ambulances and granting them an immediate green signal while keeping other lanes to the intersection on hold. By processing live traffic data from multiple intersections, it optimizes signal timing, reduces congestion, and improves road safety. Experimental results demonstrate high detection accuracy, effective vehicle tracking, and significant reduction in traffic delays, offering a scalable, AI-driven solution for modern urban traffic management.

Keywords –Traffic Management, YOLOv11, Vehicle Detection, Ambulance Priority, Intelligent Transportation System.

Paper No. ICRRCE-137

AI Powered Personalized Learning Platform for Dyslexia

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Abstract - Dyslexia is a learning disorder that affects reading and comprehension abilities. This project presents an AI-powered Dyslexia Detection and Personalized Learning Platform, designed to assist dyslexic children through machine learning-based prediction and interactive educational games. The platform features a Dyslexia Test, where user responses are analyzed using a trained ML model to predict dyslexia likelihood. Based on the results, the system recommends personalized learning activities to improve reading and cognitive skills. Developed using Flask for the backend, CSS, HTML, and JavaScript for the frontend, and Pygame for interactive games, the platform offers an engaging and effective solution for early dyslexia detection and intervention.

Keywords - Dyslexia Detection, AI-powered Learning, Machine Learning, Gamification, Personalized Education, Flask, Pygame, Web-based Assessment, Early Intervention, Cognitive Development.

Paper No. ICRRCE-138

An enhanced intrusion detection system using GNN

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Abstract – With the exponential growth of Internet of Things (IoT) devices, securing IoT networks from cyber threats has become crucial. Traditional intrusion detection systems (IDS) struggle to adapt to the dynamic and interconnected nature of IoT environments. In this study, we propose a Graph Neural Network (GNN)-based IDS that models network traffic as a graph, allowing effective detection of malicious activities. Our approach utilizes Graph SAGE for feature learning and Multi-Layer Perceptron (MLP) for link prediction to classify network connections as normal or attack traffic. Experimental results demonstrate high detection accuracy, making GNN-based intrusion detection a promising solution for securing IoT networks. In the evolving landscape of Internet of Things (IoT), ensuring network security has become more critical than ever. With the massive influx of interconnected devices, traditional security systems struggle to keep up with the dynamic and complex nature of IoT-based attacks. In this work, we propose a graph-based machine learning approach for intrusion detection in IoT networks using a custom model built with Deep Graph Library (DGL) and PyTorch. Our methodology transforms network flow data into a graph structure, where each communication between devices is treated as an edge with associated features, and nodes are embedded using Graph SAGE layers. We train a multi-layer perceptron (MLP) edge predictor to classify types of interactions, whether normal or one of several attack categories including DDoS, DoS, Reconnaissance, and Theft. The model is evaluated using a reduced version of the CIC-IoT2022 dataset, preprocessed and balanced to enhance learning efficiency. Experimental results show that our model achieves high accuracy and generalizes well across various attack types.

Keywords: Cyber Security, Network intrusions, Graph Neural Networks (GNN), Packet level analysis, Performance metrics, Effectiveness Evaluation, Bot-IoT.

Paper No. ICRRCE-139

AI-Driven Umpire Review and Pitch Predictions

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Abstract –This project focuses on creating advanced technology to assist both the on-field umpire and the third umpire in making important decisions about Leg Before Wicket (LBW). The primary objective is to determine with high precision whether the batsman is out or not-out. The technology is designed to make decisions more accurate while also reducing the wait time for players as the third umpire reviews the ball's path to make the right call. One of the key features of our AI-Driven Decision Review System (AI-DRS) is the removal of the controversial umpire's call. Currently, the umpire's call holds significant weight, meaning that in cases where the third umpire is uncertain, the final decision is influenced by the on-field umpire's judgment, whether the verdict is out or not-out. Our AI- DRS eliminates this ambiguity and ensures that decisions are made based on a more objective analysis.

Keywords –Umpire's Call Elimination, Pitch Prediction, Leg Before the Wicket Analysis, Third Umpire Assistance, Trajectory analysis.

Paper No. ICRRCE-140

Multimodal AI: Transforming Images into Narratives with Gemini and OpenAI APIs

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Abstract – The AI-Driven Story Generator is a cutting-edge project designed to revolutionize storytelling by combining advanced artificial intelligence technologies. The system leverages the Google Gemini API to analyse and interpret images, extracting contextual and semantic information about visual elements. This allows the AI to understand the content, themes, and nuances within an image, serving as the foundation for generating meaningful narratives. By integrating sophisticated image-processing capabilities, the system can interpret not just objects in an image but also their relationships, emotions, and potential storylines. Once the visual data is analysed, the project utilizes the OpenAI API to transform these insights into engaging and coherent narratives. The text-generation model processes the extracted semantic details, creating dynamic stories that are tailored to the image's content. This integration between visual interpretation and text generation bridges the gap between the creative and analytical domains of AI, enabling the system to produce narratives that are both contextually accurate and creatively rich. The result is a seamless workflow that transforms static images into immersive storytelling experiences.

Keywords –AI storytelling, Google Gemini API, OpenAI GPT, semantic analysis, narrative generation, multi-modal integration.

Paper No. ICRRCE-141

Automated attendance system using wall mounted – camera

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Abstract - The Automated Attendance System Using Wall-Mounted Camera leverages advanced Machine Learning (ML) and Deep Learning (DL) techniques to revolutionize the traditional attendance process [2]. This system deploys a high-resolution wall-mounted camera integrated with state-of-the-art face detection and recognition models to identify students in real time with exceptional accuracy [3]. By continuously monitoring the classroom, it captures student presence at specific intervals, marks attendance automatically, and updates records instantly [11]. A critical feature of the system is its ability to detect unauthorized exits by tracking movement patterns, ensuring comprehensive monitoring [5]. The system is designed to operate seamlessly across multiple class periods, providing period-wise attendance logs without manual intervention [16]. Powered by deep learning models such as FaceNet or ArcFace, combined with efficient object tracking algorithms, the system ensures high reliability even in challenging scenarios like varying lighting conditions or partial occlusions [4]. This project introduces a fully automated, scalable, and secure solution to the problem of manual attendance, reducing human error and administrative workload while enhancing accountability [8]. Its potential extends beyond classrooms, with applications in corporate offices, events, and other settings requiring efficient attendance management [7]. By integrating cutting-edge ML/DL models and real-time video analytics, this system represents a significant step forward in smart classroom technology, promising accuracy, scalability, and ease of use [19]. The system also incorporates robust data encryption and privacy measures to ensure the protection of personal information, complying with data protection regulations [6]. Its adaptability allows for easy integration with existing learning management systems (LMS) or enterprise resource planning (ERP) software, facilitating a smooth transition and minimizing disruption in daily operations [7]. Furthermore, the system's user-friendly interface provides teachers and administrators with easy access to detailed attendance reports, analytics, and alerts, making it an invaluable tool for both operational efficiency and decision-making [12].

Keywords - Metabolic illness, Neuropathic Ulcer, Blood vessels, Neural Network Models, Foot Ulcer Classification.

Paper No. ICRRCE-142

IoT-Powered Predictive Maintenance: Real-Time Sensor Data Analysis for Industrial Equipment Health Monitoring and Failure Prevention

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Abstract— The Predictive maintenance has emerged as a vital approach for maintaining the optimal performance and extending the lifespan of industrial equipment. This study focuses on developing an IoT-based predictive maintenance system designed to monitor the condition of industrial equipment in real-time through the analysis of sensor data. The system utilizes IoT-connected sensors to gather continuous data on key operational metrics such as temperature, vibration, pressure, and energy usage. Sophisticated machine learning techniques, including time-series analysis and anomaly detection models, are applied to identify early indicators of equipment wear or failure. By integrating data from various sensors, the system enhances its ability to detect intricate patterns and anticipate potential failures before they happen. Furthermore, the platform features an intuitive interface that provides operators with real-time notifications and practical insights, enabling prompt maintenance actions. The system's efficacy is tested using actual industrial datasets, showcasing its ability to minimize downtime, streamline maintenance schedules, and enhance equipment reliability. This research seeks to boost operational efficiency, reduce maintenance expenses, and prolong the service life of essential industrial machinery through proactive monitoring and maintenance.

Keywords— Predictive Maintenance, Industrial IoT (IIoT), Real-time Monitoring, Equipment Health, Sensor Data Analysis, Machine Learning, Arduino, Vibration Sensor, Temperature Sensor, Voltage Meter, Automated Alerts, Maintenance Optimization

Paper No. ICRRCE-143

Implementation of ASCON Light-Weight Cryptography block for OpenPLC and its evaluation on C-DAC
VEGA RISC-V Microcontroller

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Abstract –Industrial control systems (ICS) are subjected to cybersecurity audits, not only in the Information Technology (IT) domain, but also in the Operational Technology (OT) as specified in IEC 62443 security standard. In contrast to IT systems, OT systems consist of diverse physical subsystems that are often part of legacy industrial systems. These systems often use traditional communication protocols such as Modbus RTU running on interfaces such as RS485. Since they are conventionally run on proprietary high-cost hardware that are opaque to security software updates, they may lead to ICS Audit non-compliances. The urgency and operational significance associated with mitigating such non-compliances often force business customers to spend huge money to get proprietary security software patches installed from ICS vendors. This paper proposes an opensource resilient control mechanism for securing industrial control systems by applying a staggered strategy of renovating the industrial communication systems. The solution is two-fold: first, to adopt opensource hardware for implementing control logic developed through opensource applications; second, by cascading a computationally inexpensive encryption algorithm to the field input/output (I/O) signals. The solution has been demonstrated through OpenPLC, an opensource development application that executes automation logic on indigenously developed ARIES VEGA boards, based on opensource THEJAS32 Processor that runs open RISC-V instruction set. In order to improve the I/O security, ASCON, a light-weight crypto-coupler block has been implemented through PLC Ladder Logic programming. The ladder block can be integrated into any existing PLC code, in order to improve the overall security of the industrial process hardware.

Keywords –OpenPLC, ARIES VEGA THEJAS32 Processor, RISC-V Instruction Set, Industrial Automation, Ladder Logic, Modbus, ASCON, Light-Weight Cryptography

Paper No. ICRRCE-144

An aggressive parallel pattern mining algorithm for predicting user behavior in sensor application data

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Abstract – The Proposed algorithm is Aggressive Parallel Pattern Mining, mainly focuses on Web Log Analysis for predicting user behavior with robustness's. This algorithm helps in business intelligence in finding accurate patterns in web log file with improved efficiency in finding time complexity and space complexity. The performance of Aggressive Parallel algorithm improved when compared to existing algorithms such as GSP, PrefixSpan and SPADE. This research work calculates support count and confidence to predict frequent itemset. The robustness of the algorithm will be checked with varying data size. The novel proposed algorithm Aggressive Parallel Pattern Mining efficiently implemented for better Prediction rate and prediction accuracy for varying datasets. The proposed algorithm time complexity and space complexity is better compared to existing algorithms.

Keywords - GSP, SPADE, LAPIN & FAST

Paper No. ICRRCE-145

Wireless Kinematic Control of A 4-DOF Articulated Robotic Arm Mounted on a Smart Mobile Platform

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Abstract –This project presents the design and implementation of a wireless kinematic control system for a 4-degree-of-freedom (4-DOF) articulated robotic arm mounted on a smart mobile platform. The system integrates an Arduino microcontroller as the core processing unit to control the robotic manipulator and the mobile base, enabling precise motion and task execution. The robotic arm consists of four servo-actuated joints, allowing for a range of articulated movements, while the smart platform is driven by DC motors for omnidirectional mobility. Wireless communication via Bluetooth or Wi-Fi facilitates remote operation through a mobile application, providing intuitive user control and real-time feedback. The system incorporates inverse kinematics algorithms to achieve accurate positioning and trajectory planning for pick-and-place operations in dynamic environments. Sensor integration, including ultrasonic and infrared sensors, enhances autonomous capabilities such as obstacle detection and environmental awareness. This project offers a cost-effective and scalable solution for industrial applications such as warehouse automation, material handling, and inspection tasks. The modular design and wireless capabilities make it suitable for educational purposes and research in mobile manipulation and robotics.

Keywords – 4-degree-of-freedom (4-DOF), robotic arm, Wireless communication, Servo Motor.

Paper No. ICRRCE-147

Smart Helmet With Rear View & Accident Detection System For Increased Safety

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Abstract – The smart helmet is an innovative safety system designed to enhance road security by integrating accident detection, vehicle theft alert, and alcohol sensing functionalities. The system leverages advanced sensors, cloud computing, and IoT technologies to ensure real-time monitoring and reporting. An accelerometer is embedded within the helmet to continuously track motion and detect erratic variations that may indicate an accident. Once a crash is detected, the system automatically communicates vital information, including the location obtained via GPS, to emergency contacts through a cloud-based service. This ensures prompt medical assistance and rapid response, significantly reducing fatalities. Additionally, a vehicle theft alert system has been incorporated to improve security. The system detects unauthorized vehicle movements and sends instant notifications to the owner via cloud-based services, preventing possible theft. To further enhance safety, an alcohol sensing feature has been integrated into the system. Before the vehicle starts, an alcohol sensor detects the rider's breath for alcohol consumption. If alcohol is detected beyond a permissible limit, the system prevents the vehicle from starting, ensuring that intoxicated individuals do not operate the vehicle. This crucial feature helps in preventing accidents caused by drunk driving. By utilizing IoT and cloud connectivity, this smart helmet seamlessly integrates with smart city infrastructure, offering a reliable, efficient, and automated solution for accident reporting, theft prevention, and drunk driving deterrence. The system represents a significant advancement in road safety, contributing to reduced accident rates and improved security for riders and their vehicles.

Keywords - Microcontroller (IOT), GPS & GSM, Sensors, Bluetooth, Driver Circuit and LCD Display

Paper No. ICRRCE-148

Chronic Kidney Disease Prediction Using Machine Learning

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Abstract – Chronic kidney disease also recognized as Chronic Renal Disease, is an uncharacteristic functioning of kidney or a failure of renal function expanding over a period of months or years. Habitually, chronic kidney disease is detected during the screening of people who are known to be in threat by kidney problems, such as those with high blood pressure or diabetes and those with a blood relative Chronic Kidney Disease (CKD) patients. So, the early prediction is necessary in combating the disease and to provide good treatment. This study proposes the use of machine learning techniques for CKD such as Ant Colony Optimization (ACO) technique and Support Vector Machine (SVM) classifier. Final output predicts whether the person is having CKD or not by using minimum number of features.

Keywords – dataset, Machine learning, Classification method, etc.

Paper No. ICRRCE-149

Optimizing Heat Dissipation: A CFD Analysis of Rectangular Fins with Different Configurations

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Abstract- Fins are protruding surfaces on an object that enhance heat transfer to or from the environment. Basically, fins are used in Motorcycles, computer CPU, Heat sinks, Transformers etc. In this project base model is taken which is interrupted rectangular fin type and to this base model increased the surface area of fin by creating rectangular slots on fins. These models are made by using a CAD tool called SOLIDWORKS. These models are imported to ANSYS 19.2. CFD analysis is performed on these two models under forced convection at inlet velocities of 0.5m/s, 1m/s, 2m/s and at heat inputs of 100°C, 150°C by using ANSYS 19.2. Heat flux, and temperature difference of both models are compared. From the analysis Heat flux of the rectangular fin with rectangular slots is 2.1 times Heat flux of the base model in each case and also heat transfer rate is increased in modified model (model-2) compared with the base model.

Keywords – Fins, CAD Software, Ansys Software, CFD, Fusion 360

Paper No. ICRRCE-150

Facial Image Forgery Detection through Enhanced Deep Learning Algorithm

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Abstract –Facial image forgery detection has become increasingly critical with the rise of deepfake technologies, posing serious risks to privacy, security, and trust. This project, titled Facial Image Forgery Detection through Enhanced Deep Learning Algorithm, aims to develop a robust solution for distinguishing between real and fake facial images. By employing a Convolutional Neural Network (CNN) architecture, the system will classify images into two classes: real face and fake face. The project focuses on leveraging CNN's ability to automatically extract complex features from images, enhancing detection accuracy. Various data augmentation techniques will be applied to improve model generalization and reduce overfitting. The ultimate goal is to achieve high accuracy in detecting facial image forgery, contributing to efforts in safeguarding digital identities and mitigating the impacts of manipulated media. Through this research, we aim to provide an efficient, scalable, and reliable solution to address the growing challenge of deepfakes.

Keywords –CNN's You Only Look Once, Facial Image Forgery Detection, deep learning, image classification, digital forensics, adversarial image analysis, AI-driven forgery detection, media authentic.

Paper No. ICRRCE-151

Integrated Stock Market Analysis Using Apache Superset and MySQL

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Abstract – This project presents an integrated stock market analysis dashboard utilizing Apache Superset, an open-source data visualization platform, and MySQL for data storage. The system is designed to streamline stock analysis by providing interactive dashboards with customizable charts, including line, bar, candlestick, and scatter plots. Users can analyze historical stock data, identify trends, correlations, and patterns, and generate insights to support decision-making. The proposed dashboard enhances data exploration by enabling filtering and dynamic analysis across multiple metrics. By combining an intuitive user interface, open-source technology, and real-time visualization capabilities, the project offers a cost-effective and scalable solution for investors and traders.

Keywords – Stock market analysis, Apache Superset, MySQL, Interactive visualization, Decision support, Data exploration, Custom metrics.

Paper No. ICRRCE-154

A Comprehensive Survey on Video Denoising using Machine Learning

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Abstract – Video denoising is crucial for improving the visual quality of the videos that are affected by various types of noises. Traditional denoising methods are effective for 2D images, but they often struggle with the temporal and spatial correlations. To overcome these challenges, machine learning algorithms, especially deep learning, have emerged as powerful solutions. This paper reviews the latest advancements in video denoising using machine learning algorithms. It begins with an analysis of conventional machine learning methods and deep learning methods, such as Convolutional Neural Networks, Recurrent Neural Networks, 3D CNNs, Generative Models, and Attention Mechanisms. A comparative analysis of these methods is provided, based on their performance and efficiency. This survey also identifies the current research gaps and outlines the future directions for improving video denoising algorithms.

Keywords –Artificial intelligence, Machine Learning, Video denoising, deep learning, CNNs, RNNs, attention mechanisms, temporal noise, spatial correlations, noise reduction, video enhancement.

Paper No. ICRRCE-155

Wireless Battery Management System in Electric Vehicles: Analysis of state-of-the-art Techniques

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Abstract – Wireless Battery Management Systems (WBMS) are significant steps in monitoring and controlling energy storage, which varies from electric vehicle applications to renewable energy applications and smart grid systems. They operate on wireless communication technologies such as Zigbee, Bluetooth, and Wi-Fi, eliminating the need for complex wiring increasing the potential weight reduction of the system, and minimizing potential reliability issues. This paper elaborates on designing and implementing a microcontroller-based WBMS that monitors real-time key parameters such as voltage, current, and temperature. All these parameters are transmitted wirelessly to centralized management units or mobile devices for analysis. State estimation algorithms further enhance the reliability of key metrics such as SOC, SOH, and fault diagnosis. WBMS catches real-time information from all cells in the battery using sensors and wirelessly transmits it to a central monitoring unit. This paper aims to analyze recent advancements in EV BMS technology and identify potential future research directions. This paper explores the challenges and opportunities associated with implementing BMS in electric vehicles and presents an in-depth review of the existing literature.

Keywords – Battery monitoring, battery management system, wireless data transmission, battery safety system, state of charge, state of health.

Paper No. ICRRCE-156

Machine Learning-Based Detection and Classification of Silicon Wafers

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Abstract – In semiconductor manufacturing, very fine fabrication processes are required, and even a slight deviation leads to defects in silicon wafers, affecting yield and quality. The early diagnosis and classification of faulty wafers are critical to enhancing process efficiency and reducing losses. We use the semiconductor manufacturing process (SECOM) dataset, which includes sensor readings and signal data collected from various stages of the wafer fabrication process. Considering the problems of high-dimensional data, imbalanced classes, and noise, this study explores different approaches of ML and DL models to improve the defect detection during manufacturing processes. Among the ML techniques that are explored are K-Nearest Neighbour (KNN), Decision Trees, Support Vector Machines (SVM), and Random Forest, whilst Deep Neural Networks (DNNs) are used for feature extraction and classification.

Keywords – machine learning, support vector machines, random forest etc.

Paper No. ICRRCE-157

Convolutional Neural Network Architecture to Detect Polycystic Ovary Syndrome (PCOS) from Ovarian
Ultrasound Images

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Abstract – The proposed system, while innovative and effective, has certain limitations that need to be addressed for broader applicability. One significant limitation is the relatively small dataset size used for training and testing, which, although larger than many previous studies, may restrict the model's ability to generalize across diverse populations and imaging conditions. Additionally, the test dataset, while independently curated, may not fully represent real-world variations in ultrasound imaging, such as differences in machine settings or operator techniques, potentially affecting the system's robustness in practical scenarios. Another limitation is the exclusion of clinical data, such as hormone levels or patient history, which could provide a more comprehensive diagnostic framework and improve accuracy

Keywords – machine learning, CNN Model, etc.

Paper No. ICRRCE-158

Robotic Arm for Pick and Place Application with Color recognition monitoring using IoT

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Abstract – The field of robotics has seen remarkable advancement due to the integration of various engineering disciplines such as mechanical, communication, and electronics. This interdisciplinary approach has significantly contributed to the creation of highly adaptable robotic systems. While current technology allows robotic control within a range of 500 meters, the focus of this research is to extend this control range to over 1,600 kilometers. The project relies on WiFi-based communication, where two computers—connected via WiFi—facilitate data exchange. One computer is located near the robot and interfaces with a microcontroller that governs the robot's movement. The central goal of this project is to design and develop a robotic arm capable of performing pick-and-place tasks, utilizing the ESP32 NodeMCU as its primary controller. This project merges concepts from both electrical and electronic engineering. By leveraging the capabilities of the ESP32 microcontroller from Microchip Technology, the objective is to build a cost-effective, compact, and efficient robotic arm tailored for educational environments. Input signals are received from Android-based applications and transmitted via WiFi to the controller. The robotic system responds to these commands by moving in specified directions and performing actions such as starting or stopping. It also includes a TCS3200 color recognition sensor module, which detects and differentiates environmental colors like red, green, blue, and white. The robot's operations, including arm control, are managed through an Android app connected to the Blynk Cloud, with the ESP32 also handling color detection for real-time interaction with its surroundings.

Keywords –Robotic Arm, IoT, Pick and Place, ESP32, Color Recognition, Blynk Cloud, TCS3200.

Paper No. ICRRCE-159

AI Therapist Using Natural Language Processing

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Abstract - The main objective of our project is to handle with the stress of people, especially youth, IT professionals using natural language processing technique. A human being's cognitive system can be simulated by Artificial Intelligence Systems. An Expert System for Stress Management (ESSM) is a system that mimics the role played by a psychologist or counsellor of stress expert to provide a virtual consultancy. Our system is an upgraded version of the old stress detection systems which provides the user-friendly communication, stress detection, and appropriate remedy. The success of implementation and development of this project is expected to help in reducing time consumed and human power in determining the best recommendation and solution for stress management. Therapist GPT is a groundbreaking AI-powered therapist that leverages advanced Natural Language Processing (NLP) and Machine Learning (ML) techniques to provide effective mental health care to patients. Building on previous research in conversational AI for therapeutic sessions, Therapist GPT aims to address the shortage of mental health professionals and make therapy more accessible to everyone. This paper delves into the design, implementation, evaluation, and ethical considerations of Therapist GPT, while discussing its potential to revolutionize the mental health care industry. Mental health indicates the degree of psychological prosperity. When someone faces an unbalanced psychological state, it ends up in disturbance. In India, the quantity of cases regarding the psychological disorder is increasing each year, and there's a shortage within the mental healthcare professionals. In such situations, technologies like computing helps to fill the gap. In recent days, many industries have began to adopt the chatbot for answering user's question with the assistance of chat interfaces. With the newest development in technologies, it's become easy to develop a chatbot application, but the applying itself could be a complex system. it's a challenge to attain the efficiency, effectiveness and also to satisfy the users while developing a chatbot. due to chatbot's popularity and user-friendly features, it's taken the place of humans. during this project, we analyze the performance of the chatbot which is able to ask a series of question on the premise of Depression Anxiety Stress Scales (DASS), and take user to next level, which is recording answers to a different set of questions, if necessary. Finally, the mental state of the user are going to be analyzed by the chatbot. during this work, we propose a classification approach supported deep neural networks, Bi-LSTM, CNN for emotion detection

Keywords - NLU(natural language understandings), CBT (Cognitive Behavioral Therapy)

Paper No. ICRRCE-160

Chat with Multiple PDFs & Text Files using LangChain and Google Gemini Pro

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Abstract – The explosive growth of online content has led to challenges in extracting contextual, relevant information from a set of documents. Keyword-based search is irrelevant or imprecise, without consideration of the semantics of the user query. To counter this, our project provides an intelligent document interaction system based on Google Gemini Pro and Lang Chain integration, enabling users to interact with multiple PDFs and text files in real time. The Universal Sentence Encoder (USE) is the center of our system, which embeds document content into high-dimensional semantic vectors. These vectors are indexed with FAISS (Facebook AI Similarity Search) for context-aware and efficient retrieval. When a user inputs a query, the system retrieves contextually relevant chunks of content using FAISS and generates coherent, accurate responses using Google Gemini Pro. Lang Chain manages prompt handling and conversation flow, enabling multi-turn interaction. A Streamlit interface has been utilized for simple file uploading, query processing, and response visualization. The proposed system achieved a semantic retrieval accuracy of 98.7% and response generation time of less than 5 seconds, demonstrating its reliability, efficiency, and domain adaptability. This work shows the potential of semantic search, conversational AI, and user-friendly interfaces for improved multi-document understanding.

Keywords – Universal Sentence Encoder, FAISS, LangChain, Google Gemini Pro, Semantic Search, Multi-Document QA, Streamlit, Conversational AI, NLP, Information Retrieval

Paper No. ICRRCE-162

IoT based Data Logger for Home Weather Monitoring using Arduino Uno R3

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Abstract –This article describes the design and implementation of a room temperature controller using Arduino and DHT11 sensor. Fan speed control systems are also prepared. DHT11 sensor detects the ambient temperature and given in the form Celsius. Both usage and measurement values for measurement and usage are shown in the liquid crystal display (LCD). Arduino microcontroller monitors the operation of the system, receives the measured values and compares them with the set parameters. When the room temperature exceeds the maximum temperature, the fan starts working. The greater the difference between hot and cold, the greater the responsibility of the fan and the faster it works. Finally, if the room temperature is within the set values, all loads are turned off. This means that the room temperature remains the same. The aim of this project is to use an electronic device that will alert the user in the event of a problem in the kitchen, to ensure the safety of the family working in the kitchen. A room's temperature and humidity can be determined with the DHT11 temperature sensor. Then, MQ2 gas sensor is used to detect air pollution and smoke in the room Index terms: Arduino Nano, DHT11 sensor, DC fan, MQ2 Gas sensor, LCD display, I2c module, BMP180, Arduino IDE, Embedded C

Keywords –Arduino Uno R3, DHT 11, Internet of Things (IOT), BMP180, MQ2 Sensor, Liquid Crystal Display (LCD)

Paper No. ICRRCE-164

Performance Analysis Of Content Based Image Retrieval Systems

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Abstract – Content-Based Image Retrieval (CBIR) fundamentally relies on matching images based on their visual characteristics, prioritizing perceptual resemblance over any metadata descriptions. Content-based image retrieval methods typically use features like color, texture and shape. However, these methods have a meaningful problem: the difference between simple visual features and a deeper comprehension of the image limits how accurately they can find what's being searched for. Our CBIR system uses standard techniques like HSV histograms, Discrete Wavelet Transform (DWT) and Feature Vectors and it also incorporates deep learning models like VGG16 and ResNet50. Deep learning greatly improves image retrieval accuracy, for it extracts high-level semantic features. The proposed method, a deep learning-based approach, shows superior retrieval accuracy and efficiency. Compelling experimental results show this meaningful improvement over current best practices.

Keywords – Visual similarity, Content-Based Image Retrieval, CBIR, Deep learning, High-level semantic features

Paper No. ICRRCE-165

Intruder Detection and Alerting System with Machine Learning

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Abstract – The Intruder Detection and Alerting System Using Machine Learning introduces an innovative security mechanism aimed at enhancing surveillance efficiency in high-risk locations such as offices, homes, and restricted areas. By combining machine learning models with computer vision techniques, this system provides a proactive approach to identifying and responding to potential security threats. The system employs a facial recognition algorithm capable of verifying individuals against a secure database of authorized personnel. When an unauthorized person is detected, the system captures both images and video evidence while generating a critical alert. This alert is reinforced by audio notifications and visual evidence, which are promptly forwarded to security personnel via various communication channels, including mobile applications, SMS, and emails, ensuring swift and informed responses.

Keywords – Intrusion Detection, Automated Surveillance, Real-Time Monitoring, Facial Authentication, Behavior Recognition, Machine Learning Security, Intelligent Alerting, Video Analytics.

Paper No. ICRRCE-167

FACM-CXR: Fog-Assisted CNN Model for Accurate Pneumonia Classification and Detection from Chest X-Rays

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Abstract – Early and effective detection of pneumonia will ensure good clinical management of patients. A Fog-Assisted CNN Model is proposed in this study to quickly and precisely classify pneumonia from CXR images. The model uses Convolution Neural Networks implemented in TensorFlow for pneumonia or normal classification. A dataset of 5,856 images of X-rays was used; this was augmented with various data augmentation techniques to allow for generalization and to reduce overfitting. To leave room for real-time deployment, it combines fog computing, thereby bringing computational resources closer to the sources of data. This reduces latency, optimizes the use of used bandwidth, and increases privacy with data, making the model suitable for limited cloud-connected healthcare environments. Integrating deep learning and distributed fog computing, FACM-CXR provides an efficient solution for the automated diagnosis of pneumonia.

Keywords–Pneumonia Detection, Fog Computing, Chest X-ray Classification, Automated Diagnosis, Healthcare AI, Medical Image Processing, Real-time Processing

Paper No. ICRRCE-168

An Integrated IOT to monitor weather using SEN-00194 Rain sensor and smart farming through the analysis of Soil moisture

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Abstract – In recent years, monitoring systems have become more and more significant in our daily lives. An automated weather monitoring system is proposed to provide dynamic, current weather information for a certain location. The suggested system is predicated on embedded systems and internet of things (IOT) technology. The system incorporates electronic devices, sensors, and wireless technology. This study proposes a smart system that forecasts a field's irrigation requirements using open-source technology. It does so by detecting ground characteristics like soil moisture content and environmental factors, in addition to utilizing online weather forecast data. The system's intelligence stems from a clever algorithm that takes into account sensory data in addition to weather forecast characteristics like humidity and air temperature for the near future. The Blynk App platform receives the data from the system in order to forecast the ideal conditions for crop growth and increased crop production. The cornerstone of agriculture is soil and weather, which together affect crop productivity and growth.

Keywords – Internet of Things (IoT), DHT-11 Temperature and humidity sensor, SEN-00194 Rain sensor, Soil Moisture sensor.

Paper No. ICRRCE-169

Harvest Intelligence: CNN-based forecasting prices of agricultural commodities

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Abstract – Over the past few years, the farming industry has faced considerable difficulties due to erratic price changes in legumes and produce. This initiative aims to create AI-ML models utilizing Convolutional Neural Networks for precise prediction of agricultural commodity prices, including pulses and vegetables. By analysing historical market information, climate trends and supply demand relationships, the CNN-based system offers powerful forecasting abilities to assist farmers, traders and policy makers in making well-informed choices. Through the application of sophisticated deep learning methods, the model enhances agricultural efficiency and market stability, delivering a dependable solution for commodity price prediction. This endeavour represents progress in incorporating AI-driven insights into agriculture, laying the groundwork for more intelligent, data-based decision- making and long-term economic development.

Keywords – Agriculture, Ensemble, CNN, Decision-making

Paper No. ICRRCE-170

Enhanced Brain Stroke Prediction and Diagnosis using a Hybrid Transformer Based BiLSTM Model

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Abstract – Stroke remains a major cause of neurological disability and mortality, making early and accurate detection crucial for effective treatment. This study presents an advanced deep learning framework that integrates Convolutional Neural Networks (CNNs), Bidirectional Long Short-Term Memory (BiLSTM) networks, and transformer-based attention mechanisms to improve stroke classification using brain CT scans. The CNN module extracts spatial features through multiple convolutional and pooling layers, while BiLSTM captures sequential dependencies from the extracted representations. The attention mechanism dynamically prioritizes significant features, leading to enhanced classification performance. To ensure robustness, the dataset undergoes preprocessing, including pixel normalization, image resizing (227×227), and augmentation techniques to balance class distribution. The model is trained in a cloud-based environment with GPU acceleration, optimizing computational efficiency for both training and evaluation. Its effectiveness is measured using key performance metrics, such as classification accuracy, precision, recall, F1-score, and the area under the ROC curve (AUC), ensuring a comprehensive assessment. The experimental findings indicate that the proposed model surpasses conventional deep learning approaches in stroke detection, demonstrating superior predictive accuracy. The integration of attention mechanisms enhances interpretability, allowing for more precise and reliable diagnoses. This research highlights the growing significance of AI-driven medical diagnostics, offering a structured framework for early stroke identification. By incorporating state-of-the-art deep learning strategies, this study contributes to the ongoing advancements in precision medicine. The results reinforce the importance of intelligent automation in clinical decision-making, bridging the gap between computational efficiency and medical accuracy. This work lays a strong foundation for future AI-based innovations in healthcare, further refining stroke diagnosis for improved patient outcomes.

Keywords – Stroke Detection, Hybrid Deep Learning Model, Transformer Encoder, BiLSTM Network.

Paper No. ICRRCE-171

Fraud Detection in Banking Data: A Hybrid Deep Learning and Reinforcement Learning Approach

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Abstract – Fraud detection in banking remains a significant challenge due to the increasing complexity and adaptability of fraudulent activities. While traditional machine learning models such as XGBoost, LightGBM, and CatBoost have demonstrated promising results, their static nature limits their ability to adapt to evolving fraud patterns. In this study, we propose a hybrid deep learning and reinforcement learning approach to improve fraud detection in banking transactions. Our methodology combines deep neural networks (DNNs) for initial fraud classification with reinforcement learning (RL) to dynamically adjust fraud detection thresholds based on real-time transaction patterns. We employ Bayesian optimization to fine-tune hyperparameters, address class imbalance using SMOTE and class weight tuning, and evaluate the model using diverse metrics, including Precision, Recall, F1-Score, Matthews Correlation Coefficient (MCC), and ROC-AUC. Experimental results on the Kaggle credit card fraud dataset demonstrate that our approach achieves higher F1-score (0.82) and MCC (0.83) compared to traditional methods. We also visualize model performance using ROC curves, Precision-Recall curves, and confusion matrices. The proposed framework adapts dynamically to new fraud patterns, enhancing real-world applicability. Future work includes integrating explainable AI (XAI) techniques for improved interpretability and deploying the model in real-time fraud detection systems.

Keywords –Fraud Detection, Deep Learning, Reinforcement Learning, Machine Learning, Banking Transactions, Anomaly Detection, Bayesian Optimization, Credit Card Fraud.

Paper No. ICRRCE-172

The prediction of the stock price based on sentiment, multi-source data combination and optimized deep learning

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Abstract – Stock market prediction has become increasingly complex with the growing influence of diverse data sources and market volatility. The proposed system aims to enhance the MS-SSA-LSTM model by incorporating additional layers of sentiment analysis and integrating multisource data, including macroeconomic indicators such as GDP growth and inflation rates, along with sentiment extracted from news articles. The system employs Principal Component Analysis (PCA) for robust feature selection, effectively reducing noise and dimensionality while retaining essential features for prediction. A simplified Long Short-Term Memory (LSTM) model is utilized for time-series forecasting using synthetic data that reflects realistic market behaviour. To provide a comprehensive evaluation of the model's performance, the project expands traditional evaluation metrics by including Mean Percentage Error (MPE) and Symmetric Mean Absolute Percentage Error (SMAPE), alongside MAE and R². The results are visualized through detailed plots that highlight actual vs. predicted stock prices, training loss trends, and comparative metric analysis. The system is designed not only for standalone forecasting but also for integration into broader financial analysis pipelines, enhancing the reliability and accuracy of stock market predictions

Keywords –Accuracy, Principal Component Analysis, Mean Percentage error, Long short term memory, Prediction.

Paper No. ICRRCE-173

IoT based Estimation and Analysis of Human Respiratory rate using ESP8266

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Abstract –In today's society, taking care of loved ones has become a difficult task. Monitoring a patient's health at home can be a daunting task. Especially elderly patients need to be monitored regularly and occasionally informed about their health at work. Therefore, we want an innovation that can work easily. Our system offers an intelligent health monitoring for patients that uses sensors to follow the patient's condition and uses the network to alert family members of any issues. Our system uses heart rate and body temperature to analyse the patient's health status. This project consists of four sections. The first section is DHT11 temperature sensor, the second section is MAX30100 pulse oximetry sensor, the third part is respiratory sensor, and the fourth part is WIFI module. There is a microcontroller connected to the sensors. to monitor events, and an LCD display and Wi-Fi connection to transmit health data. If the system detects a abrupt change in the patient's body temperature and heart rate it will automatically pass information about the patient's condition to the user via the Wi-Fion Blynk platform.

Keywords –MAX30100 Pulse Oximeter. DHT11 Temperature Sensor, Node MCU ESP8266/32 controller, Respiratory sensor, LCD Display 16x2, Arduino.

Paper No. ICRRCE-174

IOT based home automation with protection system using NodeMCU ESP8266

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Abstract –The IOT Home protection system using Arduino is a system designed to protect home from losses due to accidents using Internet of things. The IOT Home Protection system using Arduino is a system designed to protect home from losses due to accidents using Internet of things. Gas leakages may lead to fires leading to huge home losses, also instant fire detection is needed in case of furnace blasts or other conditions. Also low lighting in home may create improper work conditions increasing the probability of accidents. In this paper, we are developing a system which will automatically monitor the home applications and generate Alerts/Alarms or take intelligent decisions using concept of IoT. IoT has given us a promising way to build powerful home systems and applications by using wireless devices, Android, and sensors. The system makes use of NodeMCU ESP8266 to achieve this functionality. The system makes use of temperature sensing along with light gas sensing to detect gas leakage as well as low lighting to avoid any home accidents and prevent losses. The system consists of light, gas, fire and temperature sensors interfaced with ESP8266 NodeMCU and LCD screen. The sensor data is constantly scanned to record values and check for gas leakage or low light and then this data is transmitted online. The WiFi module is used to achieve internet functionality. The Blynk server then displays this information online, to achieve the desired output. The sensor data is constantly scanned to record values and check for gas leakage, temperature and humidity, flame data and then this data is transmitted online. The wifi module is used to achieve internet functionality. The Blynk server then displays this information online, to achieve the desired output.

Keywords –Protection from Gas leakage; Saving Energy by Automation, Display, Arduino Compiler, WiFi Module, LPG CNG Gas Sensor, DHT11 Temperature and Humidity Sensor, Flame Sensor, Blynk application, embedded C

Paper No. ICRRCE-175

Stock Prediction by Integrating Sentiment Scores of Financial News and Time Series Analysis using LSTM

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Abstract –This paper presents a novel approach for stock price prediction by leveraging sentiment analysis of financial news combined with Long Short-Term Memory (LSTM) networks. The stock market is inherently influenced by a variety of factors, with news sentiment being one of the key drivers of investor behavior and market movement. We propose a methodology where financial news articles are analyzed for sentiment using natural language processing techniques, and the resulting sentiment scores are integrated into an LSTM model for forecasting stock prices. Our model combines the temporal dependencies captured by LSTMs with the emotional and market-relevant insights derived from financial news, offering a comprehensive prediction framework. The proposed approach is evaluated on real-world stock market data, demonstrating its ability to predict stock price movements with improved accuracy compared to traditional models. This work highlights the potential of combining sentiment analysis with advanced deep learning techniques to enhance the performance of stock price prediction systems.

Keywords –Stock Prediction, Sentimental Analysis, Financial News, Long Short Term Memory (LSTM), Natural Language Processing, Market Sentiment, Time Series Analysis.

Paper No. ICRRCE-176

Leveraging Deep Neural Networks for An Enhanced Virtual Fitting Room Experience

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Abstract –The assignment of virtual clothing try-on includes mapping a clothing picture onto a target person, which has picked up noteworthy consideration in later times. Past inquire about has basically centered on protecting the key characteristics of the clothing picture (such as surface, branding, and sewing) whereas adjusting it to a human posture. Be that as it may, producing photorealistic try-on pictures remains a impressive challenge, especially when there are critical occlusions and shifting human postures within the reference picture. To address this issue, we display an progressed visual try-on framework called the *Adaptable Substance Making and Guaranteeing Coordinate* (ACGPN). ACGPN to begin with assesses the basic contrasts between the clothing picture and reference person, and stabilizes the twisting prepare amid the mapping stage. Moreover, an inpainting module is utilized to combine basic data (such as the reference picture, semantic outline, and altered clothing) to powerfully remake each portion of the human shape. Compared to existing strategies, ACGPN is competent of producing photorealistic pictures with essentially made strides perceptual quality, as well as wealthier, more complex points of interest.

Keywords – Virtual Fitting Room, Deep Learning Networks, Two-Dimensional Virtual Try-On.

Paper No. ICRRCE-177

Development Of A Dual-Function Agricultural Robot For Pesticide Spraying and Grass Cutting Robot

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Abstract – An emerging field in agriculture is the use of vehicles like rovers outfitted with robotic and automatic systems. Prior to prototyping, agricultural rovers may be designed and tested with the use of appropriate simulation models. Multibody model-based rig to examine the primary problems associated with agricultural rover designs. Significant differences between the two architectures are revealed by the simulation findings, particularly with regard to energy savings, which are crucial for a rover's suitability for field operations. The suggested simulation model's modular design makes it simple to adapt to different vehicle configurations. Pest control is a useful tool for increasing crop productivity. The Automatic Grass Cutting and Pesticide Spraying Machine Project's main objective is to reduce power consumption and direct chemical exposure to people. The present idea centres on developing and constructing a pesticide sprayer that is both useful and cheaply priced in order to aid farmers in increasing crop production. With 70% of its people working in farming and related fields, India is mostly an agricultural country. To increase the country's Gross Domestic Product (GDP), agricultural production must rise.

Keywords –Agricultural robot, automatic grass cutting, 12V battery, HC-Bluetooth module, 89C52 microcontroller, pesticide spraying.

Paper No. ICRRCE-178

Optimizing Underwater Visual Clarity with Laplace Decomposition and YOLOv2 Detection

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Abstract – This paper introduces an approach to enhance underwater images using Laplace decomposition. The technique involves decomposing an underwater image into low- and high- frequency components. The low-frequency component undergoes haze removal followed by normalization to achieve white balancing. Meanwhile, the high-frequency component is enhanced to preserve edges. The ultimate improved image is generated by merging the adjusted frequency components. This method delivers superior results in terms of improved contrast, color accuracy, object visibility, edge retention, artifact reduction, and overall natural appearance when compared to existing underwater image enhancement techniques. YOLOv2 enhances real-time underwater object detection with grid-based prediction and image enhancement. It ensures high accuracy, making it ideal for marine surveillance and robotics.

Keywords – Artifact reduction, contrast improvement, edge retention, image processing, Laplace decomposition, underwater imagery, object detection, deep learning, YOLOv2, bounding box regression, confidence scoring, Non-Maximum Suppression (NMS), Intersection Over Union (IOU), underwater detection, real-time processing, feature extraction.

Paper No. ICRRCE-179

VLSI Implementation of Pseudo Random Number Generation in Blowfish Algorithm for Real Time Applications

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Abstract – This project focuses on the VLSI implementation of Digital Pseudo-Random Number Generators (DPRNGs) utilizing chaotic systems, a crucial component in cryptographic security. As internet technology advances, ensuring information security becomes increasingly vital. Security protocols rely on cryptographic methods, where DPRNGs play a fundamental role by generating sequences that must exhibit both randomness and unpredictability. To enhance operating frequency, high-performance pipeline architectures are designed for chaotic systems, including the 3D Lorenz, 3D Chua, 3D Rossler, and 3D Chen models. The proposed VLSI architectures integrate a single chaotic system with a congruent generator, significantly increasing the pseudorandom number space up to 2480. The quality of the generated random bits is validated using the NIST 800-22 test suite, demonstrating the DPRNG's suitability for highspeed cryptographic applications.

Keywords –DPRNG, Chaos, VLSI architecture, Pipeline architecture, Parallelism, FPGAZynq, Frequency, Throughput

Paper No. ICRRCE-180

ArtGAN: Generative Image Cartoonification Using VGG16

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Abstract – The project ArtGAN aims to transform real-world images to cartoon-style art through a White-Box Cartoonization system through deep learning. It employs Generative Adversarial Networks (GANs) and VGG16 feature extraction for detail enhancement and structural consistency. Surface, structure, and texture are decomposed by the model to gain better control over the cartoonization process. In comparison to current approaches such as Neural Style Transfer and CartoonGAN, this method has fewer color changes, sharper edges, and less distortion. The Fréchet Inception Distance (FID) score verifies that the generated images are very close to actual cartoons. A user study also indicated that the outputs are aesthetically pleasing and of high quality, and thus the framework is a robust and general solution for cartoonization.

Keywords – White-Box Cartoonization, Deep Learning, Generative adversarial Networks (GAN's), VGG16 Feature Extraction.

Paper No. ICRRCE-181

Dynamic Recipe Ingredient Substitution and Food Pairing Suggestion System

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Abstract –Advancements in personalized food recommendation systems leverage cosine similarity metrics to promote healthier eating habits. To solve problems with food item identification and nutritional content estimation, the study makes use of the Recipe1M dataset. It presents a semantic-based method for recipe recommendation that allows for ingredient replacements. Additionally, it investigates food pairing through compatible flavor compounds, aiming to enhance cooking experiences and dietary choices for users.

Keywords –Ingredient substitution, Preconized nutrition, Flavor compatibility, Similarity metrics

Paper No. ICRRCE-182

Prediction of Chronic Health Disorders using Machine Learning : An analysis of the state-of-the-art Technologies

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Abstract – Chronic health disorders, such as diabetes, heart disease, Alzheimer's, and Parkinson's, represent a significant global health challenge, requiring early diagnosis and proactive management. Machine learning (ML) has emerged as a transformative tool, leveraging diverse datasets like patient health records, genetic data, and imaging data to improve prediction accuracy. Integrating structured and unstructured data and preprocessing techniques like feature selection and normalization enhances model performance and reliability. Methods such as ensemble learning, Convolutional Neural Network (CNN)-based models, and hybrid approaches have shown remarkable accuracy in disease prediction, addressing gaps in traditional methods. This paper carefully identifies and synthesizes recent relevant literature related to the critical role of machine learning in enabling personalized healthcare, improving early diagnosis, and optimizing resource allocation. Also, this paper provides information on publicly available datasets and a comparative analysis of the current state-of-the-art techniques. However, challenges related to data quality, ethical concerns, and real-world applicability highlight the need for further research and innovation in predictive healthcare systems.

Keywords – Chronic disorders, Classification, Deep Learning, Ensemble Learning, Machine Learning

Paper No. ICRRCE-183

AI-Driven Facial Emotion Detection with Music Recommendation and Mental Health Tip

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Abstract – The paper presents a smart system that integrates emotion recognition with customized wellness elements. It starts with a secure process, then encourages users to submit an image for evaluation. By utilizing sophisticated emotion detection technology, the system discerns the user's emotional condition and suggests music based on emotion detected to either promote relaxation or elevate their mood. Furthermore, it delivers a personalized health recommendation aimed at enhancing well-being. This initiative connects artificial intelligence, music therapy, and health awareness, supporting both emotional and physical wellness.

Keywords – Emotion recognition, AI-driven, Music therapy, User interface, Mental health.

Paper No. ICRRCE-185

Detection of Kidney Stone from MRI scans using Advanced Image Processing Techniques

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Abstract – The identification of kidney stones is crucial for early diagnosis & therapeutic planning in patients. In the recent years, image processing algorithms have developed into effective instruments for the automated and precise diagnosis of stones using medical imaging data. This paper presents a new method of detecting Kidney stone by applying image processing techniques. A sequence of pre-processing operations are employed in the suggested algorithm to enhance the quality of Kidney images and suppress noise. These include image scaling, noise elimination, and contrast enhancement. After preprocessing, image segmentation techniques are employed to segment likely stone regions and eliminate the Kidney region from the background. A number of feature extraction methods are applied to obtain meaningful features from the segmented Kidney areas for stone detection. These features encapsulate essential stone characteristics like shape, texture, and intensity variations. The extracted features are employed to train a classifier for discriminating tumor and non-tumor areas. Experiments are performed on a Kidney image dataset containing stone and non-stone samples to evaluate the performance of the proposed method. The results indicate that the suggested method for Kidney stone detection is very accurate and efficient. Comparisons with current methods illustrate the advantages of the proposed method in detection accuracy and computational efficiency. Suggested image-based kidney stone detection system has significant promise for aiding medical practitioners in the early identification of kidney stones. It can enhance patient outcomes through the facilitation of timely intervention and tailored treatment regimens.

Keywords – IOT, Image Processing, LBP, Data Analysis

Paper No. ICRRCE-187

Village Seva Chat-Bot Using Artificial Intelligence

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Abstract – Timely access to relevant information is problematic in rural agricultural landscapes due to language barriers, low literacy rates, and poor digital infrastructure. This paper presents the development of an AI-based Farmer Assistance System aimed at bridging those gaps. The system uses advanced Natural Language Understanding and speech synthesis technologies to provide voice and text-based interaction in farmers' native languages. It offers farmers personalized messages via voice or text in the native language, providing real-time information about government schemes, agricultural techniques, and possible financial aid. It empowers farmers to make better decisions that enhance productivity and economic well-being at the same time, overcoming several accessibility and literacy hurdles.

Keywords – Artificial Intelligence, Natural Language Understanding, Speech Synthesis, Agricultural Assistance, Rural Development, Conversational AI, Farmer Empowerment, Inclusive Technology, Real-Time Guidance.

Paper No. ICRRCE-188

Enhancing cybersecurity with mitigation of DDoS attacks using AI approaches: A Survey

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Abstract – Using artificial intelligence (AI) to combat distributed denial-of-service (DDoS) assaults is a key emphasis in cybersecurity. As DDoS attacks continue to increase in complexity to greater levels, higher-level intelligence is now required for effective mitigation. Artificial Intelligence plays a major role in recognizing the need for real time detection and mitigation of such DDoS attacks. This research studies the more contemporary methodologies that include Artificial Intelligence techniques such as Machine Learning (ML) and Deep Learning (DL) for the detection of DDoS attacks. It is widely believed that modern threats are too complex to be resolved by machine learning systems. This is the essence of deep learning that seeks to improve the diagnosis and detection of complex attack patterns with the proviso that it will need enormous computer power and resources with vast datasets. To improve accuracy and robustness, hybrid and ensemble ML-DL models are analyzed. Furthermore, the report includes the aspects of AI in DDoS mitigation that include adaptive filtering, real-time decision making, and autonomous cybersecurity systems. Such problems of responsiveness could be addressed with Edge computing and AI. Other researchers look for ways to provide automated actionable mitigation recommendations using Large Language Models (LLMs). The survey of literature tackles many of the questions and shortcomings such as the demand for data, adversarial computation resources, the explainability and justification of an answer, and the need to adapt to new directions of an attack on the system. Lastly, the survey covers potential future research work on sophisticated AI models, federated learning, explainable AI (XAI), hybrid and ensemble models, systemic integration, and real-time optimization. While reinforcing the importance for further work in combating cybersecurity threats and DDoS attacks focus AI's overall contribution while emphasizing the relevance of ongoing R&D efforts to tackle existing challenges and guarantee the continuous viability of AI solutions.

Keywords – Artificial Intelligence, Cybersecurity, DDoS attack, machine learning

Paper No. ICRRCE-189

Video Anomaly Detection and Crowd Analysis Using Transfer Learning and Fine Tuning

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Abstract – Anomaly Detection (AD) plays a significant role in video surveillance, improving the level of security through observing and monitoring unusual patterns of events in real-time. Increasing crime rates, in overcrowded events and especially isolated areas, require soundly robust surveillance systems that make such tools inevitable tools to provide safety, protection from crimes, and prevent their misappropriation and usage. The process of anomaly detection is divided into three major layers. First, it is video labelling, which assigns meaningful tags or annotations to video frames for better analysis. Second, it is image processing (IP), which enhances the quality of video frames and extracts significant features critical for the detection of anomalies. Finally, it is activity detection, which focuses on specific motion patterns or behaviours that deviate from the norm, signalling potential security threats. These layers function in harmony to provide accurate and reliable detection of anomalies using Convolutional Neural Networks (CNNs) and other Machine Learning (ML) techniques. Surveillance videos, which most of the time capture realistic and diverse scenarios, serve as the basis for such detections. Advanced algorithms can recognize outliers within minimal timeframes, ensuring the efficiency of the system in real-world applications. Modern video surveillance systems can effectively address security challenges through the use of anomaly detection, making them indispensable tools for monitoring and protecting public and private spaces.

Index Terms – Anomaly Detection (AD), Image Processing (IP), Convolutional Neural Networks (CNNs), Machine Learning (ML)

Keywords – Video Anomaly Detection, Crowd Analysis, Transfer Learning, Fine-Tuning, Deep Learning, Surveillance Systems, Feature Extraction, Convolutional Neural Networks (CNN).

Paper No. ICRRCE-190

Enhancing Deepfake Detection Through Hybrid MobileNet-LSTM Model with Real-Time Image and Video Analysis

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Abstract – The race to crush information integrity and public trust is being won by one thing: deepfakes, AI manipulated media. The goal is to enhance our Deepfake detection using MobileNet and LSTM network. MobileNet's lightweight CNN architecture is able to induce the visual features in an image by an image and in a video and can pick up the slight visual clues of textures and facial structure. A temporal in-consistencies that cannot be seen by image base methods are then analyzed using an LSTM network. The hybrid model is trained on real and deepfake media datasets, and is thus adaptable to emerging deepfake techniques. This has a user face interface to analyze the real time and fly media to get the analysis and analysis score and visual feedback of the identified artifacts. Unique to this system is its versatility for images and videos, and its real time capability, making it a suitable choice for practical use in social media, journalism, and law enforcement combating the spread of misinformation with a guarantee of digital media authenticity.

Keywords –Media integrity, real-time detection, temporal modeling, image analysis, video analysis, mobilenetlstm, real time detection, deepfake detection

PaperNo.ICRRCE-191

AI Spectrum

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Abstract – “AI Spectrum” project is to develop a unified AI-driven platform that can generate code, text, images, videos, music, and other forms of content. It utilizes sophisticated models and algorithms that analyze extensive datasets to generate new content, including text, images, music, and code. In order to produce new outputs that closely resemble the original data, generative AI systems look for patterns and structures in training datasets. This ability has opened up revolutionary applications in a wide range of domains, including business innovation, scientific research, and the creative industries. Reducing biases in generated content, increasing energy efficiency, and improving model interpretability are some of the future directions in generative AI research. Generative AI is set to become a key component as the field develops. As the field develops, generative AI has the potential to become a key technological advancement that will have a big social impact by encouraging creativity, speeding up innovation, and changing how humans and AI work together.

Keywords – Neural networks, Prisma, GAN, Transformer models, Generative AI

Paper No. ICRRCE-192

Heart Attack Risk Prediction Using Retinal Eye Images

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Abstract –The burden of cardiovascular diseases on healthcare continues to be a significant global problem. Understanding the underlying mechanisms and improving the identification of people with a higher risk profile of systemic vascular disease through non-invasive examinations is crucial. In ophthalmology, retinal vascular network imaging is simple, non-invasive, and can yield in vivo information on the microstructure and health of the arteries. Various research teams have been working on software for over a decade to describe the geometric features of the retinal vascular network's arterial and venous parts and to enable automatic analysis of the network from various imaging techniques (retinal fundus photographs, adaptive optics, OCT angiography, etc.). Accordingly, the retinal vascular structure may serve as a witness to the state of the systemic vascular system. The use of artificial intelligence algorithms and datasets of retinal images in a new method known as "Oculomics" has recently sparked interest in retinal microvascular biomarkers. Despite the large volume of associated research with the role of retinal biomarkers in screening and monitoring, it is still hard to predict systemic vascular disease.

Keywords –Cardiovascular disease, Retinal vascular network, Systemic vascular disease, Non-invasive imaging, Retinal biomarkers, Artificial intelligence, Oculomics, Microvascular analysis.

Paper No. ICRRCE-193

Enhancing Security and Efficiency in Cloud Media Sharing through Deduplication

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Abstract – Nowadays Cloud media sharing has rapidly become a foundation within modern digital communication, enabling users through it to store and share particularly huge amounts of media files. Nevertheless, the rise in data that is unneeded causes hard problems regarding storage and also security. Present-day deduplication systems frequently fail when dealing with both the challenges of privacy preservation and secure ownership verification, particularly when dealing alongside encrypted and similar media files. In this paper, we put forth SecuDedup, a secure framework made for deduplication, especially for similar media files in cloud environments. SecuDedup allows the cloud to perform deduplication on individual encrypted data without any compromise of privacy, ownership, or security. SecuDedup, with the allowance from media distributors in order to set a distance threshold, guarantees deduplication only in the case that a similar file, based upon a similarity measure predefined via them, already exists on up the cloud. Our system uses advanced cryptographic methods like fuzzy extractors as well as ciphertext-policy attribute-based encryption (CP-ABE) in order to guarantee data confidentiality. Furthermore, it helps guarantee ownership security in addition to precise access management. A security analysis is formally provided, and a prototype implementation on a commercial cloud platform shows how efficient SecuDedup is. The results indicate that SecuDedup diminishes storage overhead by a measurable degree, while upholding large security guarantees.

Keywords – Secure deduplication, similarity-preserving hashing, encrypted data, fuzzy proof-of-ownership, cloud storage, encryption, decryption, Threshold-based Deduplication, Ciphertext-Policy Attribute-Based Encryption (CP-ABE).

Paper No. ICRRCE-194

A road object detection model based on improvised yolo's models of autonomous vehicles

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Abstract - Object detection finds its application in various fields like road monitoring systems and autonomous vehicles, where both speed and accuracy are of utmost importance. Although YOLO networks (e.g., YOLOv4, YOLOv7, YOLOv8) are popular due to their efficiency, the backbone models' complexity tends to limit their performance in resource-scarce environments. Here, we introduce a new method for increasing detection speed and accuracy by combining EfficientNet as the backbone of YOLO, which is specifically designed for real-time road object detection. We substitute YOLO's conventional CSPDarknet53 backbone with EfficientNet, which is a group of models applying compound scaling to control depth, width, and resolution for peak performance with fewer parameters. This adjustment decreases computational complexity while enhancing model accuracy, allowing for quicker inference without compromising detection quality. We also propose a Dynamic Feature Prioritization Module (DFPM), which distributes computational resources to high-priority objects like vehicles, pedestrians, and traffic signs, depending on the scene context. This module increases detection speed by making the model concentrate processing power on the most important objects. To further enhance performance in dynamic road situations, we introduce a Temporal Contextual Optimization module that utilizes the information from adjacent video frames to track moving objects and resolve occlusions efficiently. Through this optimization, object tracking can be enhanced and partial object detection accurately achieved, which are typical in natural road conditions. The model to be proposed is meant to run effectively on edge devices and autonomous vehicle systems with real-time detection of road objects at high accuracy and low computational cost.

INDEX TERMS Dynamic Feature Prioritization Module (DFPM), Temporal Contextual Optimization, EfficientNet Backbone for YOLO.

Paper No. ICRRCE-195

CFD Analysis on Natural Fiber Composites in rotor blades of helicopter (Black Hawk UH-60)

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Abstract –This work presents a Computation Fluid Dynamics Analysis on the rotor blades of a helicopter (black hawk uh-60). Two types of airfoil shapes of the rotor blades are considered for comparison of the analysis, NACA SC1095 & SC1095R8 are the two airfoils that provide aerodynamic forces when exposed to a relative motion of air across their surface. The rotational motion of the rotor hub initiated by the helicopter engine develops this relative motion, as well as forward, sideward and backward flight. While developing aerodynamics lift and drag forces, structural loads occur on the blades along their span and across their chord. A helicopter's rotor is generally made of two or more rotor blades. Beyond the types of airfoil shape the material of the blades were also changed with GFRP and Flax fiber reinforced composites which in turn gives the different results. Calculating results like deformation, stress, strain, safety factor, values for each model and material separately and to produce with better airfoil shape and better material here calculating the velocity stream lines distribution over the airfoil shape and pressure values and coefficient of lift and coefficient of drag values, by knowing all these results finally conclude one airfoil shape/ material rotor blade to our black hawk uh-60.

Keywords –Computational Fluid Dynamics (CFD), Rotor Blade Analysis, NACA SC1095, SC1095R8, Black Hawk UH-60, Aerodynamic Performance, Lift and Drag Coefficients.

Paper No. ICRRCE-196

Enhancing Summarization with Retrieval-Augmented Generation: A Comparative Study of Sparse and Dense Retrievers with Generative Models

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Abstract – While traditional generative models mainly rely on pre-trained language models, AI-driven content generation has gained traction in automating large-scale text creation. However, the calibre and volume of training data frequently determine how effective they are. This process is improved by Retrieval-Augmented Generation (RAG), which allows models to generate more accurate and contextually rich content by dynamically retrieving pertinent information from external knowledge bases during generation. This study examines new developments in the use of RAG for summarisation tasks and emphasises how it can improve quality. It also looks at how RAG might improve summarisation methods in the future and how it might affect AI research and applications more broadly. In order to direct scholars and practitioners toward additional advancements in the field, this paper also offers a summary of several approaches in RAG-enhanced summarisation.

Keywords – Summarization, Retrieval-Augmented Generation (RAG), Natural Language Processing (NLP), Sparse Retrieval Methods, Dense Retrieval Methods, Transformer-Based Models, Generative Adversarial Networks (GANs), Diffusion Models

Paper No. ICRRCE-198

Design and development of a prototype that converts train force on tracks into electrical energy

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Abstract – Electrical energy harvesting from force of trains on tracks, force of automobiles on speed breakers and human foot force on footpaths and steps has emerged as an advanced way of producing energy. According to the well-known Thermodynamic statement “Energy can neither be created nor destroyed, but only be transformed”, whatever happens in nature, results out of the conversion of energy in one form or the other. The present study involves, the designing and manufacturing of a prototype which can convert the force exerted by trains on the track into electrical energy. The design of the prototype involves a simple gear drive mechanism. The mechanism carries the flap, rack and pinion, gears, fly wheel, free wheel, DC generator and battery. The total design and simulation work is done in CATIA with required properties of the material used and considered the necessary boundary conditions. This proposed arrangement can result in high production of electricity and this power is utilized for many applications which are very much useful for maintenance of railways. The energy produced from this process does not require any external source of energy and not required any input cost except the initial cost. As the movement of trains will be continuous on the railway tracks the energy can be continuously produced and we can also consider this as renewable energy source. The production of energy can be still increased further by changing the dimensions of gears and drives connected.

Keywords – Energy Harvesting, Force Utilization, Transport Infrastructure Energy, Smart Railway Systems, Motion-Based Energy Harvesting, Low-Cost Energy Solutions.

Paper No. ICRRCE-200

Solar Panel Cleaning Robot

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Abstract – Today, solar energy is the most frequently exploited source of renewable energy. The use of solar panels has risen incredibly in the past years. It is installed on the top of a house or outdoors thereby exposing the panels to dust due to the pollution of air and environmental exposure. The surface of it might reduce the efficiency due to dust and dirt. The operation of such panels would be about 3% less efficient than the clean panels. The traditional cleaning using detergents and chemicals is time-consuming and labour-intensive and can be quite exhausting in a large-scale solar panel system. The quality and functionality of the panels will not be harmed by a simple and effective cleaning prototype for clearing the dust. This paper gives the survey of various solar panel cleaning robots and subsequently we come up with proposed solution that offers reduced costs of installation, regular and maximum energy output, and support for peak power generation – a way to tackle some of the current issues with solar panel maintenance and solar energy system utilization optimization.

Keywords – solar panel, solar energy, energy optimization, installation cost, peak power generation, maintenance, efficiency improvement

Paper No. ICRRCE-201

Analysing Wine Quality Using Support Vector Machines & Other Machine Learning Methods

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Abstract— Red wine quality prediction is a key issue in the field of wine production. Key factors include acidity, alcohol content, and pH factor all play important roles in determining the overall quality of a particular red wine. The study uses machine learning techniques to predict the quality of red wines based on their physicochemical characteristics. The dataset is taken from the UCI Machine Learning Repository and includes features such as fixed acidity, volatile acidity, citric acid, residual sugar, chlorides, free sulphur dioxide, total sulphur dioxide, density, pH levels, sulphates, and total alcohol content. Various machine learning algorithms are used to model the relationship between these characteristics and the score for wine quality such as Decision Trees, Support Vector Machines (SVM), and Random Forests. When analyzing these models, we find that they can acquire different degrees of accuracy in predicting their own results. In particular, Random Forest model displays a good prediction performance due to the capabilities of this model for dealing with complex or non-linear relationships in data. The results reveal that machine learning techniques can be effectively used to predict the quality of red wines. They may thereby provide production lines with greater efficiency through faults reduction and decision-making. This study underscores the importance of Feature Selection, Model Evaluation, and the potential application of AI-driven solutions to improve the winemaking process as an example.

Keywords— Red wine quality, machine learning, prediction, dataset, UCI Machine Learning Repository, Random Forest, Decision Trees, Support Vector Machines, feature selection, model evaluation.

Paper No. ICRRCE-203

Next Gen-Dementia Detection System using Leveraging AI, Neuroimaging & Deep Learning

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Abstract - Dementia, particularly Alzheimer's disease, is a growing global health concern that gradually impairs memory, thinking ability, and daily functioning. One of the biggest challenges in managing dementia is that it often remains undetected until significant cognitive decline has occurred. Our project, Next Gen Dementia Detection System, aims to bridge this gap by leveraging the power of artificial intelligence and neuroimaging for early and accurate diagnosis. We used a Kaggle-based MRI dataset to train deep learning models, primarily Convolutional Neural Networks (CNNs), to recognize even the slightest neuroanatomical changes in the brain that may signal the onset of dementia. The model is capable of classifying MRI scans into various stages such as Non-Demented, Very Mild, Mild, and Moderate Demented with high accuracy. To enhance trust and transparency in predictions, we integrated visualization tools like Grad-CAM and SHAP, helping healthcare professionals understand which regions of the brain influenced the diagnosis. Additionally, the system is designed for scalability and accessibility – optimized for cloud as well as edge deployment, making it usable on mobile devices for real-time, on-the-go screening. By combining clinical relevance with modern technology, this project aims to empower early intervention, personalized care, and better outcomes for individuals at risk of neurodegenerative diseases.

Keywords–Dementia Detection, Alzheimer's Disease, Deep Learning, MRI Scans, Convolutional Neural Networks (CNN), Early Diagnosis, Neuroimaging, AI in Healthcare, Grad-CAM, SHAP, Cognitive Decline, Medical Imaging, Edge AI, Brain Disorders, Patient Risk Assessment.

Paper No. ICRRCE-206

Wearable Smart Monitoring System for Alzheimer Patients

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Abstract – The disorder in the brain that slowly destroys the thinking skills and memory and loses the ability to do the simple tasks is known as Alzheimer's disease. The people with this type of disease, with the late onset type symptoms first appear in their mid 60 years of the age. This study is to develop a device that will be used by Alzheimer's patients, which can perform different functions that enable many functions that enable a doctor to look after the patient's condition and provide continuous care. Alzheimer patients find it difficult to remember the recent events, reasons and even to recognize people they know. The advancement of the disease makes the patient symptoms severe including difficulty with different language, mood swings due to disoriented condition, forgetting the way, lack of motivation for doing the daily chores, forgetting about self-awareness and total overall behavior. The main objective of this smart wearable Alzheimer's patients monitoring system is helping the patients to lead an independent life, assisting the treating doctor to assess control of Alzheimer's and investigate reasons for poor control and assisting health care managers to assess the quality and cost of care for patients with asthma. The device developed monitors patient's temperature, pulse and oxygen level, assist to find lost items, provide reminder to take medicine and assist care-takers to monitor patient's location. It gives this update to care-taker through the application called Blynk app.

Keywords – Alzheimer's disease, Patient's monitoring system, Blynk app, Memory loss, continuous care.

Paper No. ICRRCE-207

Militant and Weapon detection system using AI and deep learning

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Abstract – This project aims to improve crime prevention and response by addressing the limitations of current surveillance systems. Existing systems often struggle to differentiate between normal and abnormal events, leading to delayed police responses unless there's visual confirmation. To overcome this, the proposed system utilizes real-time image processing techniques on live surveillance video to automatically detect and classify abnormal activities, such as the presence of weapons. The system is structured into three processing modules. First, a Convolutional Neural Network (CNN) is employed for object detection, identifying potential items of interest within the video feed. Second, these detected objects are classified, specifically focusing on weapon identification. Finally, the third module handles monitoring, alarm triggering, and live tracking based on the detected and classified information.

Keywords – Crime detection, Real-time image processing, Classification of weapons, System of surveillance

PaperNo.ICRRCE-208

AI-Driven Chatbot for College Enquiry using NLP and Deep Learning

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Abstract – Students often require quick and precise information about college-related queries, but traditional enquiry methods can be slow and inefficient. To address this, we propose an AI-driven chatbot that utilizes Natural Language Processing (NLP) and Deep Learning to provide automated and intelligent responses. The chatbot efficiently understands user queries, interprets intent, and delivers accurate answers, ensuring a seamless and interactive experience. Developed as a web application, the chatbot offers instant access to information on admissions, courses, faculty, campus facilities, and other academic details, eliminating the need for manual assistance. It also features a smart notice board that provides real-time access to announcements, notices, and PDF documents, reducing search time and improving information dissemination. To enhance accessibility, the chatbot will incorporate speech-to-text (STT) and text-to-speech (TTS) capabilities, enabling voice-based interaction along side textual responses. This feature makes the system more user-friendly and inclusive. By leveraging deep learning techniques for better query understanding and response accuracy, the chatbot aims to transform student support services, offering a reliable and efficient solution for college enquiries.

Keywords –NLP, Deep Learning, Chatbot, College Enquiry, Voice Integration, Multi-User Support, Python, Speech-to-Text (STT), Text-to-Speech (TTS)

Paper No. ICRRCE-209

Medical Image Analysis Utilizing Gaussian Low Pass Filtering to Detect Breast Cancer in Mammogram Images

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Abstract – Medical image analysis plays an essential role and image analysis is a major difficulty in the healthcare sector. The primary goal of using mammography image filtering algorithms is to improve the images for breast cancer detections. Mammogram Image Analysis Society (MIAS) database to materials and methods of dataset to implement recommended methods are two filtering to frequency domain with spatial filtering approaches are low pass filtering to distinguish between the various methods. Because the proposed filtering approaches are Butterworth Low Pass Filtering and Gaussian Low Pass Filtering. The quantitative measurements include PSNR, SNR, MSE, SSIM, CCI, Kurtosis, Skewness, Variance, SD and Mean. Implementing the techniques are statistical measures through two filtering approaches. There are upgraded ways to implement with result and discussion from that better outcomes to gaussian are better results to mammography images of breast cancer detection.

Keywords – BLPF, GLPF, PSNR, MSE.

Paper No. ICRRCE-210

Solar Based Railway Track Fault Detection System Using IoT
(Railway track fault detection system using IoT)

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Abstract –One technique for identifying cracks in railway tracks is the Railway Track Tracer Method for Creature Detection. Many train-related incidents will be avoided with this strategy. This technology makes it simple to spot any cracks in the railway tracks and take the appropriate precautions to avoid mishaps by regularly using a camera to monitor them. The Internet of Things is the most researched topic because of its numerous applications. The advent of the Internet of Things (IOT) provides a contemporary viewpoint on railway administration. In this mode, the platform's availability is determined by an infrared sensor. In order to prevent mishaps, this technology is utilized to update the platform availability for the upcoming train. To recognize fire and cut the engine automatically. To make the platform easier to use. Most railway accidents happen because of issues with the tracks. This could be due to misalignment, an obstacle in the way, a crack on one side, or some other problem. As a result, someone has to spend a lot of time monitoring all these difficulties. We therefore developed an IOT-based Railway Inspection System that comprises a robot car with sensors that can detect obstacles on the track that could result in railway accidents. For this project, we created a monitoring and security application for rail tracks. The rails, or train lines, are monitored by an autonomous robot while we pass by them. The robot will recognize and assess the state of the track, taking into account any damage or curves. And we are controlling this bot remotely so we are getting all these data via an android app this way is monitoring the track in real time with the track fault detection. So, with this data we can prevent the remedies like accidents and train sleeping due to those faulty tracks.

Keywords –Railway Track Fault Detection System using IoT (RTFDS)

Paper No. ICRRCE-211

Performance Enhancement of Standalone PV DC -Microgrid System using Fuzzy-based MPPT Algorithm

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Abstract –The growing global demand for energy and its limited supply necessitate reducing dependency on fossil fuels and integrating renewable energy sources into the power system. Governments all around the world are concentrating on implementing smart grid technologies to fulfil the rising demand for electricity and replace outdated conventional grid systems. DC A power electronic converter is a component of micro grid systems that use solar energy from solar photovoltaic panels to produce the necessary electric power. The load and supply impedances should be identical for optimal power utilization. This study develops a boost converter to help match the load's and the solar panel's impedance so that the load receives the maximum amount of power for the most efficient use of solar energy. Using algorithms based on fuzzy logic controllers, Maximum Power Point Tracking makes sure that the solar photovoltaic panels consume the most power possible at all irradiance levels. Fuzzy logic and controllers induce mathematical models that support the entire system. Even in the face of a variety of external weather conditions, the fuzzy-based MPPT algorithms yield an impressive outcome.

Keywords –Photovoltaic (PV), Maximum power point tracking (MPPT), Boost converter, Fuzzy Logic Controller (FLC)

Paper No. ICRRCE-212

Estimating Survival Rates for Brain Tumors Using Conv3D and 3D U-Net from MRI Imaging

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Abstract -Implementing deep learning models in healthcare, specifically for classifying and segmenting tumors, involves tackling issues related to large datasets. This research examines effective methods such as batch loading, real-time pre-processing, and utilizing HDFS for improved data storage. Techniques like data augmentation, dimensionality reduction, and caching are used to boost model effectiveness. Scalable options like cloud-based platforms and distributed training systems facilitate quicker processing and efficient management of large datasets. Moreover, this study incorporates advanced techniques, including Conv3D, Gradient Boosting, and skip connections, to ensure precise segmentation, classification, and survival forecasting for brain tumors. These methodologies highlight the capacity of deep learning to enhance patient sequel and enhance traits accuracy in medical settings.

Keywords -Deep Learning, Convolutional Neural Network, Conv3D, 3DUnet, Gradient Boosting, HDF5.

Paper No. ICRRCE-213

Adaptive Learning Through AI: A Virtual Personal Assistant

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Abstract – AI is one of the latest advancements in technology, and it has transformed almost all sectors, including education. While the traditional classroom education paradigm attempts to foster learning, it is usually not capable of accommodating an individual's personalized learning needs. This study focuses on the design, development, and implementation of an AI-based educational virtual assistant aimed at improving the efficiency of education by incorporating self-directed learning paths, auto-generated notes, and customized resources. Artificial Intelligence (AI) is employed using Retrieval-Augmented Generation (RAG) coupled with Large Language Models (LLMs) to enable the system to provide contextually useful content. The virtual assistant takes user inputs, analyzes and summarizes them, recommends relevant learning materials, and predisposes user-centered learning approaches that take into consideration users' preferred time and workload. The results from the experiments assert that learners who receive training through AI are more actively engaged, retain more information, and learn better compared to students who do not go through AI learning programs. This paper proposes a case study of a system designed to analyze the structure, methodology, and result of the performance evaluation in order to support the claim of improving adaptive learning systems. Moreover, this study investigates the challenges and scope of AI use in education.

Keywords – AI-powered learning, Virtual Assistant, Retrieval-Augmented Generation (RAG), Large Language Models (LLM), Personalized Learning

Paper No. ICRRCE-214

Keeping Secrets While Learning: Privacy-Preserving Techniques in Federated Learning

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Abstract - Federated Learning (FL) is changing the way machine learning models are trained by enabling collaboration across multiple devices without compromising user privacy. This decentralized approach is particularly valuable in fields like healthcare, finance, and IoT, where sensitive data cannot be shared due to privacy concerns and regulatory constraints. However, while FL reduces the risks associated with centralizing data, it also introduces new challenges—how do we ensure data remains private while still allowing meaningful learning? To tackle this, researchers have developed a range of privacy-preserving techniques. These can be broadly categorized into cryptographic methods (such as homomorphic encryption and secure multi-party computation), perturbative approaches (like differential privacy and noise injection), and anonymization techniques. Each method brings its own strengths and trade-offs, balancing privacy, model accuracy, and computational efficiency. At the same time, integrating these techniques comes with challenges, including increased computation, slower convergence times, and scalability limitations. Beyond technical constraints, FL is already making an impact in real-world applications, from secure medical diagnostics and fraud detection to smart homes and edge-based AI. But as FL adoption grows, so do concerns about non-IID data distributions, adversarial threats, and compliance with privacy laws like GDPR and HIPAA. Researchers are now exploring solutions such as adaptive privacy mechanisms, lightweight encryption, and efficient federated aggregation methods to address these issues.

Paper No. ICRRCE-215

Beyond Human Eyes: AI-Powered Deepfake Detection Using YOLO

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Abstract – Deepfake technology is evolving rapidly, making it harder to distinguish real from fake content. With deepfakes being used for misinformation and fraud, there is an urgent need for more reliable detection methods. This study introduces a Neural Architecture Search (NAS)-based deepfake detection model that leverages YOLOv8 for fast and accurate face detection. Using the CelebDF v2 dataset, our approach enhances model robustness with data augmentation and optimized CNN architectures. The results speak for themselves—our model achieves 99.04% accuracy, significantly outperforming traditional methods (89.49% accuracy without YOLO and augmentation). By combining efficient face detection with adaptive learning, this research provides a scalable and high-performing solution for deepfake detection. Moving forward, we aim to expand datasets and explore real-time applications to strengthen digital security against AI-generated deception.

Keywords – Deepfake Detection, Neural Architecture Search (NAS), YOLOv8.

Paper No. ICRRCE-216

Predicting Sepsis with Neural Networks: A Deep Learning Framework for ICU Monitoring

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Abstract - Sepsis is a life-threatening condition that requires early detection to improve survival rates. However, traditional diagnostic methods often fail due to sepsis's complex and non-specific symptoms. Deep learning (DL) offers a promising solution by analyzing large-scale clinical data for early prediction. This study explores the use of Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks to predict sepsis using electronic health records (EHRs). By applying feature selection techniques like Recursive Feature Elimination (RFE), the models achieve high predictive accuracy, outperforming traditional scoring systems with an AUROC of 0.94. Despite these advancements, challenges remain, including data quality, model interpretability, and clinical integration. To make AI-driven sepsis prediction a reality, future research must focus on improving transparency, ensuring ethical AI implementation, and integrating real-time predictions into healthcare systems. This study highlights the potential of deep learning to revolutionize sepsis diagnosis and patient care.

Paper No. ICRRCE-218

Brain Tumor Detection in MRI Using Vision Transformers: A Federated Learning Approach

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Abstract – Brain tumor detection in MRI scans is challenging due to data privacy concerns and model limitations. While CNNs struggle with locality bias, Vision Transformers (ViTs) offer improved pattern recognition. To enhance performance and privacy, we integrate Federated Learning (FL), enabling collaborative model training without data sharing. Using the BraTS 2021 dataset, our ViT-FL model achieves 94.3% accuracy, surpassing CNNs (88.5%) and standalone ViT's (92.1%). FL also enhances generalization across institutions. This approach ensures privacy, improves diagnostics, and aligns with data protection regulations. Future work will optimize efficiency and incorporate multimodal MRI data.

Keywords – Vision Transformers, Federated Learning, Brain Tumor Detection, MRI, Deep Learning

Paper No. ICRRCE-219

Enhancing Financial Fraud Detection by Leveraging Llama2 NLP and Neo4j Graph Database for Contextual Analysis and Relationship Modeling

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Abstract – This paper presents an advanced approach to financial fraud detection by combining the Llama2 large language model's natural language processing (NLP) capabilities with the Neo4j graph database's relationship modeling strengths. By analyzing transaction data, user behaviour patterns, and network relationships, the system aims to identify suspicious activities and potential fraud. The proposed system integrates Llama2 for extracting contextual insights from unstructured data and Neo4j for efficient analysis of complex entity relationships. The multi-modal approach enhances fraud detection accuracy, reduces false positives, and adapts to evolving fraud patterns. Results from preliminary experiments demonstrate the efficacy of combining textual and graph-based analysis in a real-time fraud detection environment.

Keywords – Financial fraud detection, Llama2, Neo4j, graph database, NLP, anomaly detection, contextual analysis.

Paper No. ICRRCE-221

Hybrid Techniques Combining Signal Processing and Deep Learning for Foetal Arrhythmia Detection

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Abstract - Foetal arrhythmias, a foetal cardiovascular disease is a critical concern during pregnancy, necessitating early detection for effective intervention. Any heart rate of a baby above 180 bpm or below 100 bpm refers to foetal arrhythmia. AI technologies can assist doctors and paramedic staff in identifying such as arrhythmia. Over the last decade, an increase in wearable ECG devices has surfaced in the market which has generated large amount of data sets which are used in early detection and classification of arrhythmia. In comparison with various diagnostic methodology, ECG is a low-cost non-invasive method which measures the electrical rate of the heart. Traditional methods of foetal arrhythmia detection, such as foetal electrocardiogram (FECG), can be hindered by the accuracy of heart beat detection. Motivated by the high accuracy of arrhythmia detection in adults using deep learning on electrocardiogram (ECG) signals, this paper proposes a technique based on deep learning for detecting foetal arrhythmias using FECG. This approach segments the FECG signals and inputs these segments into a deep learning model which then classifies them as either normal or arrhythmic. This classification helps determine whether a subject is healthy or exhibits arrhythmia. Training data segments are categorized based on estimated heart beat intervals into normal, arrhythmic, or ambiguous groups; however, only clearly normal or arrhythmic segments are used in model training to enhance accuracy. The methodology leverages the PhysioNets non-invasive foetal ECG dataset, encompassing a wide range of foetal ECG recordings from various gestational stages and clinical scenarios. Employing diverse machine learning algorithms allows our model to capture complex patterns in the FECG data, leading to a robust and efficient classification system.

Keywords - Foetal arrhythmias, heartbeat detection, ECG Signals, Foetal electrocardiogram

Paper No. ICRRCE-222

Efficient Automatic Braille Character Recognition Using Lightweight CNN with Inverted Residual Blocks

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Abstract –Braille is frequently used by those who are blind or visually impaired for communication, writing, and reading. Touch is used to identify the six raised dots that make up the braille system, which is arranged in two rows and three columns. It can be difficult to commit each Braille character's dot pattern to memory, though. To overcome this issue, this study presents a novel approach to automatic Braille character recognition. The suggested method functions in two main phases. Image alignment and enhancement are done in the first stage, which makes use of a variety of pre-processing approaches to maximize the input. Character recognition is the main objective of the second stage, which uses a customized lightweight convolutional neural network (CNN). A innovative approach was used to improve the accuracy and efficiency of the network - some standard CNN modules were swapped out for inverted residual block modules, which resulted in a significant reduction in computing expenses. Robust and efficient in design, this approach can reliably detect numbers '0' through '9' and Braille characters from 'a' to 'z'. By creating a sophisticated automated system for Braille identification, the Braille Character identification project seeks to increase accessibility and foster more independence for those who are blind or visually im-paired. With a 97% identification accuracy, the model may also provide auditory feedback for the recognized characters or numbers

Keywords –Braille Character Recognition, Visually Impaired Accessibility, Convolution-al Neural Network (CNN), Inverted Residual Block

Paper No. ICRRCE-223

PhonoClear Kannada: A Web-Based Interactive Speech Therapy Platform for Kannada Speakers with Speech Sound Disorder

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Abstract –Speech Sound Disorder (SSD) can make communication challenging, particularly in languages with complex phonetic structures like Kannada, which is spoken by millions of people in Karnataka, India. Despite the availability of digital speech therapy tools, most are designed to support widely spoken languages such as English, leaving a significant gap for regional languages. This paper introduces PhonoClear Kannada, a web-based speech therapy platform designed to assist Kannada speakers with SSD through structured articulation exercises and gamification. The system uses Google Text-to-Speech (gTTS) for accurate Kannada pronunciation, speech recognition for real-time feed-back, and Kannada sentence datasets generated with the help of ChatGPT to provide diverse phoneme-rich practice. It includes Dice and Spin-Based Pronunciation Tasks to enhance engagement, transforming speech exercises into interactive learning experiences. As a web-based platform, it is accessible anytime, anywhere, making speech therapy more convenient. With its focus on Kannada phonetics, interactive design, and effective training methods, PhonoClear Kannada aims to bridge the resource gap in speech therapy for regional languages, offering an engaging and practical solution for individuals with SSD and Speech-Language Pathologists (SLPs).

Keywords –Speech Sound Disorder (SSD), Kannada Language, Web-based therapy system, Google Text-to-Speech (gTTS), Speech Recognition, ChatGPT, Gamified speech therapy.

Paper No. ICRRCE-224

Securing Cloud Data from Attacks Using Hybrid Cryptography

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Abstract – Cloud services reduce storage and administrative responsibilities by enabling customers to store and access their data from any location, making them an effective option in the age of huge data storage. Securing private information in an untrusted cloud environment is still a big worry, though. Even while conventional encryption methods like DES, AES, and RSA work well, relying just on one approach puts data in danger from sophisticated decoding attacks. To improve security, this study suggests a hybrid cryptography technique that incorporates RSA, AES, and DES. One of the methods is used to encrypt each of the three sections of data, which are then stored on the cloud. To safely embed the encryption keys in a picture, Least Significant Bit (LSB) steganography is used. To access the data, users supply encrypted keys that have been validated against those contained in the picture. After authentication is successful, the data is encrypted and put back together. This technique increases user trust in cloud storage solutions and fortifies data security.

Keywords – Steganography, compression, AES, DES, RSA, session key, LSB steganography, random generator, image steganography, Security data, Cryptography.

Paper No. ICRRCE-225

Integrated Deep Learning System for Real-Time Traffic Accident Detection and Emergency Notification in Smart Cities

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Abstract – Effective accident detection techniques are essential for improving safety and expediting traffic management in smart cities due to adaptive and instability volatility of road traffic. In addition to providing a thorough overview of various congestion crash types, such as tail-end collisions, side smash, and frontal impact accidents, this paper provides an in-depth investigation study of popular accident detection methods, illuminating subtleties of other cutting-edge approaches. By combining RGB frames with optical flow data, our innovative method presents Lightweight solution created especially for incident monitoring in smart city traffic tracking systems is the I3D-CONVLSTM2D model architecture. The empirical analysis of our experimental investigation highlights how effective our model design with a remarkable Mean Average Precision (MAP) of 87%, I3D-CONVLSTM2D RGB + Optical-Flow (trainable) model performed better than its competitors. Incidents have become a major source of death in India, primarily because victims do not receive help right once, not because of the incidents themselves. Victims frequently go unattended for extended periods of time, especially in places with high-speed, sparse traffic, such as highways, which increases the likelihood of deadly consequences since medical care may be delayed. This study presents AcciVue, a proactive system that uses a real-time accident detection technique to improve road safety. AcciVue analyses CCTV video feeds for prompt accident detection by integrating deep learning neural networks, including LSTM, CNNs. AcciVue enhances road user safety by optimizing emergency response, minimizing accident consequences, and rapidly notifying local police stations and hospitals upon detection. This creative solution demonstrates the revolutionary potential of deep learning technology in tackling the complex issues surrounding road safety. Our results provide more insight into the difficulties caused by unbalanced data, especially when dealing with a small collection of datasets, configurations, and flow situations. In the conclusion, our study shows the way to an advanced vision-based accident detection system that can send alarm notifications to nearby hospitals.

Keywords – I3D-CONVLSTM2D, CONVLSTM2D RGB, Optical-Flow (trainable) model, Mean Average Precision, vision-based accident detection system, alert notification, GPS

Paper No. ICRRCE-226

Easy Glide IoT-Enabled Patient Carrier: Seamless Transport Experience for Physically Disabled Individuals

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Abstract – This project proposes an ergonomic wheelchair to stretcher and vice versa convertible system aimed at improving patient care by reducing the physical strain involved in manual transfers. The design integrates advanced technologies to ensure safer, more efficient movements between mobility aids, enhancing the comfort and safety of patients while reducing the physical toll on healthcare professionals. This innovative approach is particularly beneficial for physically disabled individuals, providing them with greater ease and independence in transfers. Additionally, the system can be operated through a mobile app, further enhancing convenience and accessibility. It also addresses space concerns in healthcare environments, presenting a solution that could increase operational efficiency and set a new standard in patient transfer mechanisms

Keywords – Arduino Micro controller, IoT module, Ultrasonic sensor, Physically challenged, Stretcher.

Paper No. ICRRCE-227

Personalized Career and Education Navigator with Machine Learning

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Abstract – This study aims to create a web-based Career and Educational Recommendation System using Machine Learning. Many students make career choices under societal or familial pressure, often leading to dissatisfaction and unfulfilled potential. To address this issue, we propose an enhanced recommendation system that not only suggests careers aligned with students' academic performance but also provides a structured educational roadmap to help them achieve their goals. By leveraging advanced machine learning techniques, the system evaluates individual strengths, academic performance, and preferences to deliver personalized career recommendations. Additionally, the system incorporates mathematics and science variation analysis to refine recommendations based on students' proficiency in these subjects. This approach simplifies career planning, bridges the gap between aspirations and required skills, and empowers students to make informed, confident career decisions for a fulfilling future.

Keywords – Career Recommendation System, Educational Guidance, Personalized Career Suggestions, Academic Performance Analysis, Student Career Planning, Educational Roadmap, Mathematics and Science Variation, Intelligent Career Counseling, Web-Based Recommendation System

Paper No. ICRRCE-228

Classification and Conversion of 2-Dimensional Image to 3-Dimensional Image (X-ray, MRI, CT images)
Using AI and Deep Learning Techniques

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Abstract - This thesis explores the classification and conversion of 2D medical images (X-ray, MRI, and CT) into 3D images, leveraging advanced AI and deep learning techniques. As medical imaging technologies continue to evolve, the need for efficient and accurate interpretation of medical data has become more significant. This work addresses the challenges in transforming 2D images, typically captured during routine diagnostic procedures, into 3D models, which can provide a more comprehensive understanding of the patient's condition. The proposed methods employ deep learning algorithms such as Convolutional Neural Networks (CNNs), Generative Adversarial Networks (GANs), and other AI-based frameworks to perform this conversion while maintaining the integrity of the diagnostic data.

Key words - Classification and Conversion of 2-Dimensional Image to 3-Dimensional Image (X-ray, MRI, CT images) Using AI and Deep Learning Techniques

Paper No. ICRRCE-229

Establishing A Framework for Fruit Quality Classification Using AI

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Abstract – This project demonstrates the method for detection of fruit disease and grade(accuracy). Diseases in fruits and plants are the main reasons for the agricultural loss. This work focuses on developing a user-friendly tool which recognizes the level of the disease and grades them accordingly. This model uses convolution neural networks (CNN) for the classification, which is again retrained using transfer learning technique. Identification and classification of diseases of fruits are done through various algorithms. The main focus of our work is obtaining the analysis of different fruit disease detection techniques and also provides an overview of these techniques. Research on detection of disease and fruit grading is useful for agriculture and farmers. By identifying the type of disease in fruits and also grading of fruit based on its quality. For detection of disease required different features of fruit and classifiers classified these features. For the fruit grading segments the image after segmentation calculates the infected and healthy portion of fruit and grading based on percentage of infection on fruit. The classification accuracy for the proposed solution is achieved up to 98.41%.

Keywords – Fruit Quality Classification, CNN Model, Fruit grading

Paper No. ICRRCE-230

Background verification system using cognitive data processing (CDP)

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Abstract – The Background Verification System using Cognitive Data Processing is an innovative solution designed to overcome the limitations of traditional background checks. By leveraging technologies like Generative AI and Cognitive Data Processing (CDP), the system automates the verification of candidate credentials—offering faster, more accurate, and reliable results. It intelligently extracts and organizes information from resumes, educational certificates, and ID documents using document intelligence, even handling complex or unstructured formats. Generative AI then transforms this data into structured formats for seamless cross-referencing with databases and references, enabling precise detection of discrepancies or fraud. Unlike conventional methods that are often time-consuming and error-prone, this system delivers fully automated, scalable verification with detailed, easy-to-understand reports. Security is built-in, with encryption and role-based access ensuring data privacy throughout the process. Designed to support modern hiring needs, it reduces operational costs, minimizes delays, and enhances accuracy – ultimately fostering transparency and trust in recruitment.

Keywords – Background Verification; Cognitive Data Processing; Artificial Intelligence; Machine Learning; Identity Validation; Digital Footprints; Behavioural Analysis; Natural Language Processing; Automated Screening; Data Security.

Paper No. ICRRCE-231

Design of Self-Charging Solar Powered Electric Vehicle with Cylindrical Battery

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Abstract - The designing and advancement of cylindrical batteries and solar-powered Self-charging systems for electric vehicles (EVs) aim to meet the rising demand for sustainable and efficient energy solutions in the automotive sector. This initiative investigates the incorporation of high-performance cylindrical batteries, known for their superior energy density, affordability, and adaptability, with a cutting-edge solar charging mechanism that utilizes renewable solar energy to enhance the vehicle's power supply. The cylindrical battery configuration is optimized to maximize energy retention while ensuring a lightweight and robust structure, promoting both efficiency and durability. The solar self-charging system is designed to harness and Convert sunlight into electricity, minimizing dependence on external charging networks and increasing the mileage capacity of electric vehicles (EVs).

Keywords - Solar panel, Microcontroller, Photovoltaic panel, Arduino UNO, Light Sensor, LDR.

Paper No. ICRRCE-232

Drug Influence Detection System using image processing

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Abstract – Real-time variable choice of precision spraying operations in fields benefits from the constant acquisition of crop morphology. Costly LiDAR and ultrasonic radar can't maximise their high precision. They may slow down decision speed because the current spraying amount control needs to include more information about branches and leaves, which highly relies on the statistical features of regional morphology. Since most agricultural tools in China are medium in size and relatively inexpensive, it makes sense to create a unique identification system that combines deep learning with cheap monocular vision. A crop's growth cycle was a helpful gauge for direct spraying because of the knowledge gained. For this reason, let's examine cotton as an example: This study aims to develop a single-camera acquisition system and propose an algorithm based on the Convolutional Neural Network (CNN) to identify different growth stages of cotton plants. An optimal CNN model structure is chosen among nine possible model structures using an optimization procedure based on the matrix of confusion and recognition efficiency, and its dependability is established by repeatedly switching the training and test sets by the k-fold test concept. This CNN model has an F1-score of 96.39%, an accuracy of 94.27%, a precision of 95.31%, a recall of 95.76%, and a recognition speed of 72.46 ms per picture. Also, the convolution neural network, the model suggested in this study, performs better than those of VGG16 and AlexNet. Finally, spraying deposition tests were conducted over three distinct cotton growth stages to validate the accuracy of the developed identification system and the viability of the sprayed decision-making algorithm based on CNN. The findings of the studies confirm that the ideal spray parameters were applied during distinct growth times correspondingly, leading to an increase of up to 63.24% in the optimum index over the operations that did not discriminate growth periods, yielding an overall increase of 43.29%.

Keywords – Metabolic illness, Neuropathic Ulcer, Blood vessels, Neural Network Models, Foot Ulcer Classification.

Paper No. ICRRCE-233

Secure Sharing of Identity KYC Using Cryptography

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Abstract –In the digital era, secure identity verification plays a crucial role in sectors like finance, telecommunications, and governance. Know Your Customer (KYC) processes, although necessary, often lead to repeated submissions and potential data exposure. To address these challenges, this project proposes a cryptography-based framework for secure and efficient sharing of KYC data. The system ensures that personal identity information is shared only with authorized entities through encryption. Moreover, the encryption techniques allows users to prove specific credentials without disclosing underlying data. This approach minimizes redundancy, enhances data privacy, and offers a one-time KYC model that supports reusability across trusted platforms. The proposed model aligns with privacy laws and provides a scalable, secure, and user-controlled method for digital identity sharing.

Keywords – KYC, Cryptography, Digital Identity, Secure Data Sharing, Data Privacy.

Paper No. ICRRCE-234

Automatic detection of brain tumors using convolutional and recurrent neural network

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Abstract - Detection of brain tumors is an important part of medical imaging, since early detection can greatly enhance treatment. The conventional approaches are based on human interpretation of MRI scans, which is error-prone and time-consuming. An automated system for detecting brain tumors based on Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN). CNNs accurately identify spatial features from MRI scans and pinpoint regions of tumors with high accuracy, while RNNs enhance the detection of patterns through learning of sequential relations. With the integration of both these networks, the system increases the accuracy of classification, reducing possibilities of misdiagnosis. The suggested method is meant to be effective, accurate, and efficient for a wide range of tumors and therefore the perfect instrument for radiologists. Experimental results indicate that the proposed hybrid deep model improves detection effectiveness and can, in addition, be improved to ensure clinical practice in real settings.

Paper No. ICRRCE-235

Smart Automation for Air Quality Monitoring using ML Techniques

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Abstract – Monitoring of urban air quality has been an ongoing issue since the onset of industrialization. Analysis of air quality of some region is a primary factor to identify pollution index. Globally, air pollution has been a major concern for both the government and the populace. Acid rain, global warming, heart disease, and skin cancer are just a few of the clear negative effects of air pollution on the environment and human health. Utilizing machine learning techniques to compute the air quality index is the primary goal of this system. The air quality index is forecasted using effective classifiers. The proposed approach can assist cities control and reduce air pollution. system that benefits the government and the general people. variables such as m10, pm2.5, no2, o3, co, and so2. used to predict the air quality index. The system was created as a real-time tool to help the public reduce air pollution.

Keywords – Video, Data Science, Air Quality, ML Algorithm, Naïve Bayes, KNN, Data Analysis, Supervised Learning, Software Application.

Paper No. ICRRCE-237

YOLO Powered Smart Glasses for Enhanced Vision Assistance

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Abstract – This project presents an innovative assistive technology designed to enhance the independence and mobility of visually impaired individuals by providing real-time environmental awareness. This smart wearable system integrates computer vision and sensor to detect and identify objects in the user's surroundings with high speed and accuracy. The core of the system is a Raspberry Pi running the YOLO (You Only Look Once) object detection algorithm, which processes live video feeds captured by an onboard camera. Detected objects are immediately translated into audio feedback, enabling users to perceive their environment effortlessly. Designed for portability and ease of use, the lightweight goggles include additional features such as Bluetooth connectivity for wireless audio output and a compact power source for extended usability. The system ensures seamless interaction through an intuitive activation mechanism, allowing users to engage with their surroundings confidently. Future enhancements, such as obstacle detection using ultrasonic sensors, facial recognition for identifying people, and GPS-based navigation for spatial awareness, are being explored to further enrich the functionality of this smart glasses. By combining state-of-the-art computer vision, embedded systems, and assistive technology, smart glasses aims to bridge the gap between technology and accessibility, fostering a more inclusive society where visually impaired individuals can navigate their world with greater autonomy and confidence.

Keywords - Assistive Technology, Smart Goggles, Computer Vision, YOLO Algorithm, Object Detection, Raspberry Pi, Audio Feedback, Visually Impaired, Accessibility, Artificial Intelligence, Embedded Systems, Real-Time Processing, Obstacle Detection, Facial Recognition, GPS-Based Navigation.

Paper No. ICRRCE-239

Dynamic Classifier Selection and Data Balancing for Accurate Thyroid Disorder Diagnosis using CNN and RNN

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Abstract – Identifying thyroid disorders accurately presents a significant challenge due to the intricate data patterns and pronounced class imbalances found in clinical datasets. To appliance this issue, a versatile DL framework is by combining Convolution Neural Networks (CNN and Recurrent Neural (RNN) improve thyroid classification. The model utilizes Data Balancing methods reduce imbalances incorporates Dynamic Classifier Selection (DCS) to effectively choose the best model during the inference phase. A comprehensive preprocessing pipeline is established to manage missing data and prepare the dataset for compatibility with deep learning. With a diagnostic accuracy of 87.50%, this approach also shows considerable enhancements in precision, recall, and F1-score, confirming its dependability. In accordance with Explainable AI (XAI) standards, the system provides interpretable results that support clinical decision-making. This hybrid framework delivers a precise, scalable, and understandable solution for the automated diagnosis of thyroid disorders.

Keywords – Thyroid Disorder, Deep Learning, Dynamic Classifier Selection, Data Balancing, CNN and RNN

Paper No. ICRRCE-240

AI Enhanced BLDC Motor control using RBFN-ANN and Sepic Converter for Power Quality Optimization

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Abstract – The industrial applications are extensively in use with the BLDC motors over the past decades. These motors have received their significance due to their high performance and efficiency. Though the efficiency is reliable, precise torque acquisition has become a challenging based on the studies from the state of the art. Also, superior power quality maintenance becomes crucial. In order to overcome these challenges, a system is proposed with the combination of a voltage-source inverter (VSI), a SEPIC converter. This system is built on an AI based Radial Basis Function Neural Networks (RBFN). The SEPIC convertor is proven to improve the power quality by reducing the harmonics in the input current. Hence the research found to produce better power quality. The efficiency the PMBLDC motor is achieved by the VSI. while the SEPIC converter improves power quality by reducing input current harmonics and providing better power factor. The dynamic adjustment of the input load condition and the maintenance of the torque and speed is enabled by the AI based RBFN-ANN controller. The research is experimented and observed with the commendable efficient in term of performance and accuracy. These results observed are to be worth computationally and with proper speed regulation, power quality maintenance and outperformed the other state of the art techniques.

Keywords – Permanent Magnet Brushless DC (PMBLDC) Motor, Speed Regulation, Total Harmonic Distortion (THD), Torque Ripple, Radial Basis Function Neural Networks (RBFN), Single-Ended Primary Inductor Converter (SEPIC), Voltage Source Inverter (VSI)

Paper No. ICRRCE-241

AI and IoT Enabled Human Safety System: An Intelligent Approach for Real-Time Threat Detection and
Emergency Responses

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Abstract – Human safety, especially for vulnerable groups such as women, children, and the elderly, is a pressing concern. This paper presents an embedded system designed to deliver real-time emergency alerts and threat detection within rescue range. Upon activation via a panic button, the system captures GPS location, records audio through a microphone, and takes images using a hidden camera. It transmits this data via a GSM module (SIM800C) to predefined emergency contacts and nearby users within the rescue range. By ensuring swift communication and evidence sharing, the system supports rapid intervention and aids law enforcement in critical situations.

Keywords –Human safety, Embedded system, Emergency alert, GSM module, GPS tracking, Hidden camera, Microphone, Rescue range.

Paper No. ICRRCE-242

Interconversion of audio, video, braille using machine learning algorithms

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Abstract – Advancements in technology have significantly improved accessibility for individuals with both hearing and visual impairments. This paper presents an intelligent system that enables seamless conversion between sound, text, and Braille. The proposed framework facilitates smooth transitions between spoken language, written script, and tactile Braille using text-to-speech, automatic speech recognition, and Braille translation techniques. The system ensures high accuracy and real-time processing for effective communication. A key feature of this system is its reinforcement learning-based feedback loop, which optimizes performance for tasks such as text-to-Braille (T2B), Braille-to-text (B2T), and speech-to-text (STT). Methods such as bidirectional processing, attention mechanisms, and sequence-based learning enhance text normalization, Braille encoding, and speech synthesis. By continuously improving translation accuracy, this system serves as a valuable tool for individuals with disabilities.

Keywords – Machine Learning, Automatic Speech Recognition, Text-to-Speech, Speech-to-Text, Text-to-Braille, Bidirectional LSTM

ICRRCE-243

Quantum Enhanced Deep Learning Approaches for Automated Retinopathy of Prematurity Detection

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Abstract – Diabetic retinopathy (DR) stands out as one of the top causes of blindness globally, highlighting just how crucial it is to identify it early and take steps to prevent irreversible damage to the retina. Thanks to some recent advancements in deep learning, we now have some exciting new methods to enhance our diagnosis and screening processes for DR. In this paper, we explore how convolutional neural networks (CNNs) can play a key role in automating the detection and classification of DR. By utilizing a publicly available dataset of retinal images, we developed and evaluated a CNN-based model designed to accurately identify and assess the severity of DR. The findings from our experiments reveal that our model not only detects DR effectively but also classifies it with remarkable accuracy, surpassing many of the leading methods currently in use. These results truly highlight the potential of deep learning techniques to improve early detection and management of DR, offering a valuable tool to alleviate the strain on healthcare systems and ultimately enhance patient outcomes.

Keywords–Automated Detection, Quantum Machine Learning, CNN, Medical Imaging, Neural Networks, Quantum Neural Networks.

Paper No. ICRRCE-244

Evaluation of cache replacement policies using champsim

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Abstract – ChampSim is a widely used trace-based simulator designed for research in computer architecture, particularly in evaluating processor microarchitecture components such as branch predictors, cache hierarchies, and memory systems. It is commonly employed in VLSI (Very Large Scale Integration) design and simulation to model and analyse processor performance under various workloads. ChampSim enables users to implement and test different cache replacement policies, prefetching strategies, and branch prediction techniques efficiently. Its modular structure allows researchers to integrate and compare custom micro architectural components with minimal modifications. This makes it an essential tool for VLSI designers and computer architects to explore optimizations in processor design before hardware implementation.

Keywords – VLSI simulation, ChampSim, computer architecture, trace-based simulation, cache hierarchy, branch prediction, memory systems.

Paper No. ICRRCE-245

IoT-Based Underground Cable Fault Detection

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Abstract - Underground cables are prone to various issues due to environmental factors, physical wear, and damage caused by rodents. Identifying the exact location of a fault in these cables is challenging, often requiring extensive excavation along the entire cable route. To simplify this process, an IoT-based cable fault detection system is introduced. This system helps maintenance personnel pinpoint the exact location of a fault, reducing the time, cost, and effort involved in repairs. By leveraging IoT technology, authorities can remotely monitor and analyze faults in real-time. The system employs a network of voltage dividers placed along the cable to detect anomalies. When a fault occurs due to a short circuit between two wires, the system calculates the corresponding voltage drop using a resistance network. The microcontroller detects this voltage variation, determines the fault's distance, and displays the data on an LCD screen. The fault information is transmitted online, allowing for remote monitoring and faster maintenance responses.

Keywords – Microcontroller, Relays, ADC (Analog to Digital Converter), Underground Cable Fault Detection, IoT (Internet of Things).

Paper No. ICRRCE-246

Daily Dasoha: Mid-Day Meal Ledger Application

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Abstract – ‘Daily Dasoha’ project is a new computerized portal launched to facilitate monitoring and management of food grain prices under India's mid-day meal scheme quite significantly. The project is one of the world's largest school meals schemes, providing essential nutrition to school children and ensuring they remain healthy and well-performing at schools. The traditional practice of maintaining accounts, however, is laborious and prone to inaccuracies, and it is hence not possible to identify where the resources are being utilized and how the money is being released. ‘Daily Dasoha’ overcomes these issues by automatic accounting of consumption of food grains based on the strength of students attending school on a particular day. This is aimed at minimizing busy work for school staff and the assurance of more accurate data. Portal allows the school authorities to see live data along with in-depth reports, allowing them to use resources optimally and make wise decisions. Through rendering the process accountable, cutting food wastage, and distributing the meals uniformly, ‘Daily Dasoha’ works to enhance the mid-day meal scheme's input in better nutrition among students as well as to ensure children are kept at school.

Keywords – Mid-Day Meal Program, Digital Ledger System, Automation, Real-Time Monitoring, Resource Management, Transparency, Student Attendance.

Paper No. ICRRCE-247

Smart Farming System: IoT-Enabled Agribot for Automated Irrigation and Monitoring with Machine Learning

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Abstract - The world is facing a major water crisis right now and this issue can escalate even further in future, soil is of utmost importance to use this resource as optimistically as possible right now to conserve this resource in future. Also, a developing country like India has many constraints in supplying energy and sample of water to the farmers for irrigation purposes especially in semi-arid regions. Thinking about the abundance of sunlight in India, this project discusses about the design and development of solar powered Agribot for farm monitoring using IoT that also mechanizes irrigation system. The Agribot is developed using an Arduino microcontroller which is programmed such that it detects obstacles and moves accordingly around the farm and measures the moisture level in the soil using soil moisture sensor which gives a brief prediction about the water needed in that area. The raw data is uploaded in the Machine learning model to predict the crop growth in land.

Paper No. ICRRCE-248

Hybrid Approach For Deep Fake Detection

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Abstract – As the proliferation of deep fake content continues to pose a growing threat to the integrity of multimedia, this paper introduces a robust approach for deepfake detection leveraging a hybrid architecture. The proposed framework seamlessly integrates the power of Residual Networks (ResNet) for spatial feature extraction and Long Short-Term Memory (LSTM) with Convolutional Neural Networks (CNN) for modeling temporal dependencies. The ResNet component adeptly captures intricate patterns in facial and contextual information, while the LSTM-CNN module focuses on discerning dynamic facial expressions and movements over sequential frames. Transfer learning strategies are employed to bolster model generalization, combining pre-training on a large-scale dataset with fine-tuning on deepfake-specific data. Experimental evaluations on diverse deepfake datasets demonstrate superior performance in accuracy, precision, and recall, establishing the efficacy of the hybrid architecture in addressing the evolving challenges posed by increasingly sophisticated deepfake generation techniques. In summary, our novel deepfake detection framework presents a synergistic fusion of ResNet and LSTM-CNN, showcasing a promising solution that not only advances the state-of-the-art in multimedia forensics but also exhibits robustness against adversarial attacks. By effectively combining spatial and temporal information, this hybrid model holds significant potential for bolstering the accuracy and reliability of deepfake detection systems in the face of emerging threats in the digital landscape.

Keywords – Artificial Intelligence, deep learning, Residual Networks, Long Short-Term Memory, Convolutional Neural Networks

Paper No. ICRRCE-249

A Novel Encryption Approach for Securing Healthcare Data Using Machine Learning Algorithm

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Abstract – The rapid growth of digital health records and medical imaging technologies has greatly enhanced healthcare by providing quick access to critical patient data, which improves diagnosis and treatment outcomes. However, this shift to digital storage and transmission raises substantial security and privacy concerns, particularly regarding sensitive medical images. If these images are compromised, it could lead to severe consequences, such as unauthorized data access, identity theft, and privacy violations. While traditional encryption methods offer some protection, they frequently fail to adequately address the specific requirements of medical imaging, such as maintaining rapid access and ensuring diagnostic quality without degrading image integrity.

Keywords – Digital health records, Rubik's algorithm, encryption, image integrity, AES Algorithm, Securing healthcare data

Paper No. ICRRCE-250

Lung Disease Classification in X-Ray Image Using Machine Learning Algorithm

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Abstract – The Convention is an important application of deep learning in medical imaging to identify different high-accuracy lung diseases when using the abstract X-ray disease detection. The study focuses on detecting four important lung conditions: lung cancer, tuberculosis, covid -19 and pneumonia using x -rays of the chest. A CNN-based model is designed to automatically remove functions and classify diseases, offering a non-invasive, fast and reliable clinical equipment. The proposed approach aims to improve early identity and diagnosis, which causes timely medical intervention and burden on the health care system. By taking advantage of a large dataset with X -rays, the system gets significant accuracy in detecting these diseases and shows CNN's ability to medical diagnosis.

Keywords – Lung disease detection, CNN, chest X-ray, lung cancer, tuberculosis, COVID-19, pneumonia, deep learning

Paper No. ICRRCE-251

Machine Learning for Predicting Real Estate Prices

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Abstract – Speculators in the property market, such as buyers, sellers and investors alike, as well as policymakers are key players need to predict property values with precision. This project's goal is to build a machine learning model that can predict real estate values by taking important influencing elements into account. To extract property variables like location, size, and amenities from the data-set, we employed machine learning techniques such as Random Forest, Decision Trees, and Linear Regression. The predictive ability of the models was evaluated using metrics such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE). Our research revealed that ensemble approaches, such Random Forest and Decision Tree, outperformed other algorithms in terms of accuracy and robustness. The effective use of these models demonstrates how machine learning techniques may improve real estate price forecasts and facilitate well-informed real estate market purchasing decisions.

Keywords – Machine Learning, Regression Techniques, Random Forest, Data Preprocessing and Feature Engineering, Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), Property Valuation.

Paper No. ICRRCE-252

Machine Learning-Based Early Detection and Intervention for Mental Health Issues in Children

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Abstract – Early identification of the mental health conditions in children is essential for prompt intervention and appropriate treatment. This research utilizes machine learning methods to assess the probability of childhood anxiety and depression by analysing diverse behavioural, academic, and personal factors. Using a dataset collected from surveys and academic records, the model classifies individuals based on their risk of developing mental health disorders. The classification process considers multiple factors such as age, gender, academic performance, and psychological indicators, which play a significant role in early diagnosis. This study aims to analyse and compare various machine learning models, such as Decision Tree, Naïve Bayes, Logistic Regression, and Random Forest, to predict mental health disorders effectively. The Random Forest model, known for robust performance in the classification of tasks, has been finetuned to enhance its predictive accuracy in this specific application. The tuning process involves optimizing hyperparameters and feature selection to improve model efficiency and reliability. Through this comparative study, the research identifies the most effective machine learning model for detecting early signs of childhood mental health disorders. The findings aim to contribute to the development of automated, data-driven screening tools that can assist healthcare professionals and educators in identifying at-risk children at an early stage, facilitating timely intervention and support.

Keywords – Mental Health, Machine Learning, Depression, Anxiety, Early Diagnosis, Random Forest, Predictive Modelling.

Paper No. ICRRCE-255

Smart IoT Drainage System for Waste Blockage and Pipe Leakage Detection

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Abstract – In today's rapidly urbanizing world, effective wastewater management has become a critical concern, especially in densely populated areas. Conventional drainage systems often suffer from issues like waste blockage and pipe leakages, leading to serious health hazards and environmental problems. This paper presents a review of an IoT-based Smart Drainage System designed to monitor and detect waste blockages and pipe leakages in real time. The system integrates various sensors, including ultrasonic, vibration, and gas sensors (MQ135), along with GPS and GSM modules to ensure effective detection and communication. The review highlights the significance of using microcontrollers like the ESP32 for sensor integration and cloud-based data monitoring. By employing real-time alerts and precise location tracking, the proposed system aims to enhance the efficiency of drainage maintenance and reduce the need for manual inspections. This paper discusses the challenges, technological frameworks, and future scope of smart drainage systems to promote sustainable and smart city development.

Keywords – Smart Drainage System, IoT, Pipe Leakage Detection, Waste Blockage, Real-Time Monitoring, Cloud Integration.

Paper No. ICRRCE-256

Deep Learning-Integrated Web System for Proactive Autism Spectrum

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Abstract – This research outlines the establishment of an innovative web-driven system for the preliminary diagnosis and assessment of Autism Spectrum Disorder (ASD). Through the application of cutting edge deep learning methods, the system analyses multimodal information, such as behavioural patterns, physiological signals, and environmental contexts, to make an integrated and real-time analysis. The platform guarantees high precision in ASD screening and classification regardless of age differences, facilitating early diagnosis and treatment. Built with user focus in mind, it is characterized by natural interfaces, global language support, and international privacy standards compliance for protection of user data. Explainable AI methods maximize transparency through allowing users and experts to adequately interpret model judgements. The system also incorporated tailored intervention approaches as per the user's specific requirements and provides advice to caregivers, educators, and doctors. Through the integration of cutting-edge AI with accessibility and privacy sensitive design, this platform is working to enhance early detection of ASD and support more favourable developmental outcomes for those impacted.

Keywords – Autism Spectrum Disorder, Deep Learning, Convolutional Neural Networks, Recurrent Neural Networks, Long Short-Term Memory, Transfer Learning, Web Application, Multimodal Data, Personalized Education.

Paper No. ICRRCE-257

Cost-Effective Humanoid Robot for Service Applications: Integrating ESP32 for Motion and Raspberry Pi for AI Communication

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Abstract - The speed of developments in artificial intelligence (AI) and robotics has created the opportunity for automation in service industries, maximizing efficiency and ease of access. This paper proposes a half-automated ESP32 humanoid robot that is suitable for interactive customer services. The humanoid has remotely controlled movement based on an ESP32 Wi-Fi module that provides easy operation through a mobile app via Bluetooth or Wi-Fi to achieve greater reach and flexibility. AI-based communication is enabled through a Raspberry Pi, enabling the robot to handle user queries, respond accordingly, and offer interactive real-time support. The humanoid uses several MG995 servo motors for human-like hand gestures, supporting expressive movements like welcoming users with a wave. A 1.3-inch OLED display is also employed to mimic facial expressions, providing a touch of friendliness to interactions with users. This module and customizable platform is versatile in multiple service-based implementations. It has been utilized in different capacities, including a receptionist in business settings and an assistive companion for specially-abled persons, aiding real-time remote communication between the users and backend operators. By combining AI-driven speech processing with custom chat bot functionality, the humanoid robot provides a dynamic interaction system that may be adapted across various industries.

Keywords - Humanoid Robot, ESP32, AI Communication, Service Automation, Customizable Robotics, Semi Automation, IoT, Remote-Controlled Movement

Paper No. ICRRCE-258

Forest Wildfire and Wildlife Monitoring Using Weighted Hypergraph Deep Learning Model

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Abstract – This paper presents a novel Weighted Hypergraph Deep Learning (WHDL) framework for simultaneous wildfire detection and wildlife monitoring in forest ecosystems. Traditional environmental surveillance methods face critical limitations including delayed detection times, restricted coverage, and susceptibility to adverse weather conditions. Our integrated approach combines specialized deep learning architectures—VGG19 for wildfire segmentation and transformer-enhanced YOLOv5 for wildlife detection—with a sophisticated weighted hypergraph structure that effectively captures complex relationships between environmental variables and target entities. The framework implements bidirectional cross-domain knowledge transfer between wildfire and wildlife detection tasks, resulting in a 3.8% improvement in overall system robustness. Extensive evaluation on a diverse dataset of 15,000 multimodal images demonstrated superior performance, achieving 93.2% accuracy in wildfire detection and 92.5% accuracy in wildlife monitoring, substantially outperforming existing methods by margins of 3.7% and 2.8% respectively. Ablation studies confirmed the critical importance of both the weighted hypergraph structure and thermal-RGB fusion components, with performance drops of 5.7% and 7.9% when these elements were removed. The WHDL framework-maintained detection accuracy above 85% even under challenging environmental conditions including low light, dense vegetation, and heavy smoke. Furthermore, the optimized configuration achieved 20 FPS on edge computing devices, making it suitable for real-time applications including drone-based surveillance networks and IoT-enabled environmental monitoring systems. Despite these advancements, limitations remain in predictive capability and domain adaptation across diverse ecological zones. Future work will focus on incorporating meteorological data for early warning systems, implementing reinforcement learning for optimized surveillance, and developing enhanced explainable AI techniques to provide deeper insights into detection decisions.

Keywords – Deep Learning, Wildlife Monitoring, Wildfire Detection, Hypergraph Neural Networks, Computer Vision, Multi-modal Fusion.

Paper No. ICRRCE-260

Fog Based AI Framework for Accurate Early Detection of Chronic Kidney Disease

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Abstract – Chronic Kidney Disease (CKD) is a critical global health challenge, requiring early detection to prevent progression and improve patient outcomes. This study presents a Fog-Based AI Framework for the accurate and early diagnosis of CKD using machine learning algorithms. The proposed framework leverages the decentralized and low-latency nature of fog computing to enable real-time processing and analysis of patient data closer to its source. By integrating advanced machine learning techniques, including classification and predictive models, the framework ensures high diagnostic accuracy while addressing the challenges of network congestion and latency inherent in cloud-centric systems. The system's explainable AI capabilities enhance transparency, aiding healthcare professionals in decision-making. Performance evaluation demonstrates the framework's scalability, robustness, and potential for seamless deployment in resource-constrained environments. This work underscores the transformative role of fog computing and machine learning in building intelligent, distributed systems for efficient CKD diagnosis, paving the way for improved healthcare delivery.

Keywords – Chronic Kidney Disease (CKD), Fog Computing, Artificial Intelligence, Machine learning, healthcare Analytics, Scalability, Robustness, Cloud Computing vs Fog Computing.

Paper No. ICRRCE-261

Enhanced Artificial Neural Network for Examination of Heart and Diabetes Patients

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Abstract – In this paper, we present an effective electrocardiogram (ECG) grouping technique utilizing deep Artificial neural network (ANN). There are many current medical applications which give more importance to ECG. There are many DL solutions which can be used for identifying and analysis the ECG dataset. Due to this ECG signal screening finding how many people are affected by heart diseases as well as Diabetes. The ECG information data is taken in an unmonitored way. Which performs with large quantity of raw ECG data as inputs to an Artificial neural network. When every beat of ECG transforms into a 2D grayscale as an input data for ANN classification. A pre-preparing step will be executed on the electrocardiograms (ECG) for pattern evacuation. The decreased component vector was utilized as the as contribution of neural system. The diminished element vector is utilized as a contribution to a neural system. Our exploratory outcomes effectively approve that the performed ANN categorizer with the changed ECG pictures can accomplish super characterization precision with no manual pre-preparing of the ECG flags, for example, commotion, highlight extraction, and highlight decrease.

Keywords – Electrocardiogram (ECG), Artificial Neural Network (ANN)

Paper No. ICRRCE-262

Hand Gesture-Based Virtual Application

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Abstract—Hand gesture-based virtual applications are changing the nature of human-computer interactions by allowing users to interact with and communicate with digital systems naturally and without touch. This paper explains a real-time gesture recognition system working with a combination of MediaPipe and OpenCV deep learning techniques such as Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTMs). The system translates hand gestures into meaningful commands to perform several tasks such as text-to-speech conversion, controlling audio and video, and zooming based on gestures. Through visual approaches and real-time landmark detection, the application is designed to be effective in accuracy and responsiveness while coping with lighting changes, background noise, and skin-color dissimilarity. The research conducted further lays a foundation for innovation where a route for immersive and context-aware applications stemming from augmented and virtual reality lies. This could add wider acceptability on the global market while improving gesture recognition capabilities and enabling when contextualized to different cultures and languages.

Keywords - Hand Gesture Recognition (HGR), Vision-Based Recognition, Sign Language Recognition (SLR), Normalization Techniques, human-computer interaction, MediaPipe, deep learning, virtual applications, feature extraction.

Paper No. ICRRCE-263

Development of Image Steganography using the DWT-SVD Technique for Secure Communication

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Abstract - Steganography is a technique to cover the information with another information. Stegano means covered or even secret, and graphy means writing. Steganography uses diverse techniques, such as text, image, audio, video, and file. In this paper, we used the image steganography technique for secure communication using DWT and SVD techniques. The Discrete wavelet transformation is applied on the cover image, and four different coefficients like LL, LH, HL, and HH bands are obtained. The Singular Value Decomposition (SVD) is applied to the approximation coefficients (LL) band, and it provides the U, S, and V of matrices, and a secret image is obtained by altering the singular values. This approach provides enhanced robustness and security since the secret information is spread among the frequency elements, preventing any illegitimate search of the secret information. The combination of Discrete Wavelet Transform (DWT) with Singular Value Decomposition (SVD) combination method serves as an innovative technique to achieve the better Peak Signal Noise Ratio with minimal visual distortion and less Mean Squared Error (MSE) for different formatted images.

Keywords - Discrete wavelet transform (DWT), Mean Squared Error, Noise Ratio, Peak Signal, Singular value decomposition.

Paper No. ICRRCE-264

Privileged Key Search and Unlock : Role-Based Data Access with Optimized Decryption

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Abstract - The Employee Database Management System (EDMS) aims to streamline and secure employee management through an intuitive and secure platform. Built with Streamlit for a responsive interface and SQLite for efficient data storage, this system enables users to register, log in, and access employee data based on predefined roles. The EDMS's core objective is to simplify how organizations handle sensitive employee information, ensuring data accessibility while adhering to strict security standards. A significant focus of this system is data security, achieved through AES (Advanced Encryption Standard) encryption for passwords. AES, a widely trusted encryption method, is used to securely store each user's credentials. By encoding passwords before they are saved in the database, the EDMS helps prevent unauthorized access to sensitive information. This encryption layer provides a strong defense against data breaches, safeguarding user credentials and supporting data integrity. To enhance security further, the EDMS implements a role-based access control (RBAC) model, where users are assigned roles as either CEO, Manager, or standard User. Each role comes with distinct access privileges: CEOs can view and manage all employee records, Managers have access to view and manage records of Users, and standard Users can view only their own data. This role differentiation not only controls access levels but also ensures data is handled responsibly within the hierarchy of an organization. User management capabilities are another essential feature of the EDMS. This includes functionalities for registering new users, as well as options for designated users, like the CEO or Managers, to remove employees from the database. Managers are restricted to removing standard Users only, while CEOs have broader control. Such access restrictions align with organizational protocols, promoting a balanced approach to administrative authority.

Keywords - Employee Database Management System (EDMS), AES Encryption, Password Security, Role- Based Access Control (RBAC), Data Privacy, SQLite Database, Streamlit Interface, User Authentication, Data Integrity, User Management, Data Accessibility, Organizational Hierarchy, Administrative Efficiency, Sensitive Information Protection, Hierarchical Access.