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Department of Computer Science and Engineering
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Name: Mr V.M Saravana Perumal

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Name of the faculty	Title of the paper	Date	National /International /Journal / Conference	Scopus	Elseiver	IEEE	Springer	WOS	SCI	NJ	INJ
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Mr V.M.Saravana Perumal	Developing a Transparent Diagnosis Model for Diabetic Retinopathy Using Explainable AI	2025-26	National Journal							1	
Mr V.M.Saravana Perumal	Sign Language Detection in Video and Real-Time Video Calls	2025-26	National Journal							1	

1. Design and implementation of a hyper-chaotic confusion–diffusion framework for highly secure image and video transmission integrated with massive MIMO and small-cell-enabled 5G

JOURNAL OF BASIC SCIENCE AND ENGINEERING

DESIGN AND IMPLEMENTATION OF A HYPER-CHAOTIC CONFUSION– DIFFUSION FRAMEWORK FOR HIGHLY SECURE IMAGE AND VIDEO TRANSMISSION INTEGRATED WITH MASSIVE MIMO AND SMALL- CELL-ENABLED 5G NETWORKS FOR ENHANCED COVERAGE, RELIABILITY, AND QUALITY-OF-SERVICE

V.M. Saravana Perumal ¹, Dr. Balakrishna R. ^{2*}

¹Research Scholar, Part-time, USN – 1RR19PC503, VTU Research Centre, CSE Dept., RRCE, Bangalore, Karnataka & Assistant Professor, Department of Computer Science & Engineering, Rajarajeswari College of Engineering, Bangalore

²Supervisor, Principal, Professor, Department of Computer Science & Engineering, Rajarajeswari College of Engineering, Bangalore, Karnataka, India
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Abstract : - In this research paper, we present the design and Implementation of a hyper-chaotic confusion–diffusion framework for highly secure image and video transmission integrated with massive MIMO and small-cell-enabled 5g networks for enhanced coverage, reliability, and quality-of-service along with the development of the mathematical model & the results of the simulation done in the Matlab environment.

Keywords : Hyper, Chaos, QoS, Cell, MIMO

1. Aim of the objective

The aim of the proposed work is to develop and implement a highly secure and reliable multimedia transmission framework that seamlessly integrates advanced hyper-chaotic confusion–diffusion encryption techniques with next-generation 5G network infrastructures. This objective focuses on ensuring end-to-end protection of image and video data through pixel-level shuffling and diffusion mechanisms that generate extremely large key spaces, thereby making the system resilient against cryptanalytic, brute-force, and statistical attacks. Simultaneously, it aims to enhance the quality of multimedia delivery by incorporating massive MIMO and small-cell architectures to improve coverage, capacity, and reliability in both high-density and weak-signal environments. Through this dual approach, the objective seeks to achieve a balance between strong multimedia security and efficient data transmission performance, ensuring uninterrupted connectivity, high throughput, and consistent Quality-of-Service (QoS) for modern 5G-enabled communication systems [1].

2. Introduction

The modern digital ecosystem depends heavily on multimedia communication, where images and videos form the primary modes of information exchange. With the explosive growth of 5G networks, billions of devices now transmit sensitive multimedia data in real time across heterogeneous platforms. This vast connectivity has simultaneously created new vulnerabilities that expose transmitted media to interception, tampering, and unauthorized access. Conventional encryption algorithms, though widely used, often struggle to balance computational speed with the strength required for real-time multimedia protection. In parallel, the demand for ultra-reliable, high-speed communication has intensified in remote and high-density environments such as urban indoor spaces, stadiums, and smart cities [2]. These environments experience bandwidth congestion, uneven signal propagation, and interference, making quality maintenance a formidable challenge. Hence, securing multimedia transmissions while ensuring uninterrupted connectivity becomes both a technical and societal priority. A dual-focus framework that merges encryption robustness with communication reliability is therefore indispensable. This study aims precisely at this convergence—protecting multimedia at the pixel level and optimizing its delivery over intelligent 5G infrastructures [3].

3. Overall block-diagrammatic architecture

2. Developing a Transparent Diagnosis Model for Diabetic Retinopathy Using Explainable AI

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Developing a Transparent Diagnosis Model for Diabetic Retinopathy Using Explainable AI

V M Saravana Perumal¹, Surya Kiran N², Venkatesh M³, Veerendra Sehwal⁴, Tejas R Gowda⁵

¹Assistant Professor, Department of Computer Science and Engineering, Rajarajeswari College of Engineering, Bengaluru, Karnataka, India.

^{2,3,4,5} Department of Computer Science and Engineering, Rajarajeswari College of Engineering, Bengaluru, Karnataka, India.

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Dimension
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Abstract: Diabetic retinopathy (DR) is a major global health issue, accurate and timely mass screening to prevent vision loss. Although deep learning (DL) models have shown expert-level performance in automatically grading diabetic retinopathy (DR) from fundus images, their inherent "black box" nature presents a significant barrier to their use in clinical settings. Clinicians need diagnostic explanations to ensure patient safety, confirm the model's reliability, and maintain accountability. This is a requirement that systems lacking transparency cannot fulfill. This study presents the creation and testing of a Transparent Diagnosis Model (TDM) for Diabetic Retinopathy, using Explainable Artificial Intelligence (XAI) methods. Our approach combines a customized Convolutional Neural Network (CNN) for classification with the Grad-CAM method to create visual explanations at the same time.

Keyword: Diabetic Retinopathy (DR); Explainable AI (XAI); Deep Learning; Convolutional Neural Network (CNN); Grad-CAM; Interpretability; Fundus Image Analysis.

1. INTRODUCTION

Diabetic Retinopathy (DR) is an optic disease that affects the retina in the back of eye by damaging its blood vessels. This is a complication that results from improper and clotted blood circulation in the retina due to damage in the small blood vessels which. Deep learning (DL) models have quickly become very successful tools for automated DR grading, frequently matching or even surpassing human performance, as a result of the enormous volume of images that need to be interpreted and the lack of qualified ophthalmologists.

The main drawback is clinical practice, which lacks a predictive tool for proactive future management and is unreliable. The intricate, non-linear relationships between physiological responses and a variety of lifestyle factors are difficult for traditional modeling techniques to adequately capture. Simply put, existing systems lack the intelligence to turn vast amounts of personal data into actionable, forward-looking insights.

This Paper introduce the Intelligent Diabetes Management System (IDMS), this is a solution which bridges a predictive gap. We leverage the power of Advanced deep learning specifically (TCN) - Temporal convolutional network. to analyze a personalized dataset encompassing continuous glucose readings and detailed behavioral inputs.

II. SYSTEM METHODOLOGY

1. Data Ingestion and Integrity [Functionality]

[R1] [API] This model will mostly relies on ingest, complex and multi source data stream. The first requirement is a secure, high throughput API connection for the prediction model which will receive the data at minimal latency. [R2] [Data Validation] This is a part of the module where it is to sanitize, timestamp and validate incoming data and flagging anomalies before feeding it to the predictive module. This will ensure the prediction accuracy.

3. Sign Language Detection in Video and Real-Time Video Calls

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Sign Language Detection in Video and Real-Time Video Calls

VM Saravana Perumal¹, Manjunath Suresh Patil², Nikhil S H³, Mallinath⁴,
Rajath K N⁵

¹Professor, Department of Computer Science and Engineering, Raja Rajeswari College of Engineering, Bengaluru,
Karnataka, India.

^{2,3,4,5}Department of Computer Science and Engineering Raja Rajeswari College of Engineering, Bengaluru, Karnataka, India.

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Abstract: Real-time communication between signers and non-signers remains one of the biggest technological challenges. Most of the current systems use raw video frames, which are prone to a number of factors such as variation in lighting conditions, camera stability, and background clutter and image quality. This paper proposes a novel landmark-based sign language detection system that is designed for both videos and real-time video calls and provides a robust and efficient option against conventional image-based methods. The system integrates Media Pipe landmark extraction, CNN-LSTM temporal modeling and WebRTC communication, effortlessly decoding both static and dynamic gestures with high accuracy. Representing gestures as numerical coordinate sequences rather than raw images, the model shows tremendous adaptability in heterogeneous environments and demonstrates smooth performance during live interactions. Experimental evaluations validate that the proposed architecture ensures reliable detection accuracy, low latency and smooth frame rates, which makes it suitable for realistic communication scenarios.

Keywords: Sign language recognition, real-time processing, gesture detection, MediaPipe landmarks, CNN-LSTM, WebRTC communication.

1. Introduction

The broad utilization of digital communication technologies has greatly influenced the ways in which people connect, collaborate, and acquire information. However, persons relying on sign languages still suffer from many barriers to participate in conversations online through Zoom, Google Meet, or WhatsApp video calls. The barriers are partly based on the fact that sign language demands interpretation of complex hand shapes, finger arrangements, and patterns of finest motion. Human translators are very effective but rarely available during spontaneous or personal conversations; therefore, this accessibility gap continues to persist.

Traditional research in sign language recognition has focused on static hand image processing that may hinder real-time

S.No	Name of the Faculty	Title of the Book or Chapter	Page No	PUBLISHER Name	Year	Book /Book Chapter
1.	Mr V.M Saravana Perumal	Artificial intelligence techniques and its concept	978-93-6126-229-6	CIIT	2025-26	BOOK



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