3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during year

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Ms. M. Madhuri			Identification of Accident-Prone Zones and Blackspots in Abids Using QGIS	International Conference on Innovations, Challenges and Solutions in Engineering Science and Technology (ICICSET'24)	International	2024	ISBN:978-81-971735-6-1, Pg. No: 118		
2	Dr.Srinivasa Baba Viriyala	Compact Wearable Bluetooth Antenna				National	2023	ISBN-10:6206686086		Lambert
3	Dr.Srinivasa Baba Viriyala	Design of Tri-Band L shaped Parasitic Patch Antenna				National	2023	ISBN-978-81-19385-13-3		AEPH
4	Dr.Srinivasa Baba Viriyala		Design & Performance analysis of a compact S-band antenna design for wireless 5G deployment	International conference on data science, machine learning &applications	International conference	internatinal	2023			Springer
5	Dr.K.Jaya Sankar	Data science& Machine learning with R				internatinal	2023	ISBN-978-93-91679-76-7		
6	Dr.John william Carey Medithe		Impact of ocularity on EEG recordings	AIP Conference proceedings 2842(1)		internatinal	2023			Scopus

7	Zeenath		Cyber security measure for safeguarding medical image data	ICAETC-2023	International conference	internatinal	2023			Scopus
8	Zeenath		Review of security practices for medical images	ICOCS – 2023	International conference	internatinal	2023			Scopus
9	Dr.John william Carey Medithe		Review of security practices for medical images	ICOCS – 2023	International conference	internatinal	2023			Scopus
10	Prof. Pamulaparty Lavanya Dr. T. Praveen Kumar		Enhancing Sentiment Analysis with Deep Learning Models and BERT word Embeddings for Multimodal Reviews		International conference on Cognitive & Intelligent Computing 2023	Internation al	8-9 Dec, 2023	978-981-19-2358-6	Methodist College of Engineering and Technology	
11	Dr. Syed Azahad		Energy Efficient Data Aggregation Protocol for Clustering in Wireless Sensor Networks		5th International Conference on Mobile Computing and Sustainable Informatics (ICMCSI 2024	Internation al	18-19 January, 2024	979-8-3503-9523-5	Methodist College of Engineering and Technology	

12	Dr. Shaik Khaleel Ahamed		Early Detection and Accurate Prediction of Heart Disease: The Role of Stacked GRU-TCN Model		IEEE paper was Published in : 2024 International Conference on Electronics, Computing, Communication and Control Technology (ICECC)	International	02-03 May 2024	979-8-3503-7180-2	Methodist College of Engineering and Technology	
13	Prof Lavanya Pamulaparty	Sustainability in Industry 5.0: Theory and Applications				International	2024	978-1032582016	Methodist College of Engineering and Technology	Taylor & Francis
14	Prof Lavanya Pamulaparty	Industry 6.0 Technology, Practices, Challenges, and Applications				International	2024	9.781E+12		CRC Press
15	Prof. M Sharada Varalakshmi	Exploring Algorithm Design and Analysis				International	2024	978-93-6132-625-7		Scientific International Publishing House
16	Dr. Shaik Khaleel Ahamed	Natural Language Processing				International	2024	9.7882E+12		RK Publications
17	Shaik Rasool	Disease Identification and Diagnosis Using Artificial Intelligence				International	2024	9.781E+12		Apple Academic Press, Inc. Co-published with CRC Press (Taylor & Francis)

18	Dr B Laxman	Power Quality in Microgrids: Issues, Challenges and Mitigation Techniques	Fractional Order High Pass Filter Based Extremum Seeking Control for Grid Connected PV System			International	2023	ISBN: 978-981-99-2065-5	Methodist College of Engineering and Technology	Springer
19	Dr. Y. Mastanamma, Dr. Bhukya Laxman, A. Archana, K. Pulla Reddy		EV BMS With Charge Monitor and Fire Detection	E3S Web of Conferences	International Conference on Renewable Energy, Green Computing and Sustainable Development	International	2024	eISSN: 2267-1242	Methodist College of Engineering and Technology	EDP Sciences
20	N. Nireekshana		Novel Intelligence ANFIS Technique for Two Area Hybrid Power System's Load Frequency Regulation	E3S Web of Conferences	International Conference on Renewable Energy, Green Computing and Sustainable Development	International	2024	eISSN: 2267-1243	Methodist College of Engineering and Technology	EDP Sciences
21	Dr A.Rajasekhar	NA	Friction stir welding of Polypropylene and its tooling.	Friction stir welding of Polypropylene and its tooling.	6th International conference on intelligent manufacturing & energy sustainability	International	June 2024	2190-3018	Methodist College of Engineering and Technology	Intelligent manufacturing and energy sustainability smart innovations, systems technology

22			Impact of Process Parameters on Mechanical Properties of Friction Stir Welded Joints on Polypropylene Sheets	Impact of Process Parameters on Mechanical Properties of Friction Stir Welded Joints on Polypropylene Sheets	6th International conference on intelligent manufacturing & energy sustainability	International	June 2024	2190-3018	Methodist College of Engineering and Technology	Intelligent manufacturing and energy sustainability smart innovations, systems technology
23	DR. S. Sujatha	HRM: STRATEGY AND PLANNING	HRM: STRATEGY AND PLANNING	NA	NA	NA	2024	978-93-6226-312-4	MCET	JSR PUBLICATIONS
24	MRS. G. Shiba Rani Manjula	FINANCIAL MANAGEMENT	FINANCIAL MANAGEMENT	NA	NA	NA	2024	978-93-6226-308-7	MCET	JEC PUBLICATIONS
25	Dr. Swathi Mathur	Numerical Methods				National	2024	978-81-955080-2-0	Methodist College of Engineering and Technology	Techno Publishers
26	Dr. Swathi Mathur	Basic Engineering Mathematics				National	2024	978-81-972362-6-6	Methodist College of Engineering and Technology	Techno Publishers
27	Dr. Kodumuri Veerabhadra Rao & Dr. A. Arunkumar	Engineering Physics				National	2024	978-81-972362-8-0	Methodist College of Engineering and Technology	Techno Publishers
28	Dr. Zeena Jayan	Organic Chemistry				National	2024	978-93-6226-374-2	Methodist College of Engineering and Technology	JSR Publication

29	Dr. Sunil Solomon Philip	Research Trends in Language, Literature & Linguistics Volume 3 Book 2	GRAMMAR-A SENTENCE MAKING MACHINE			International	2024	978-93-6252-323-5	Methodist College of Engineering and Technology	Imprint: Iterative International Publishers (IIIP)
30	Dr Bandita Naik		A Review on Bed Morphology in Compound Channels: Processes, Patterns, and Implications,		28th International Conference on Hydraulics, Water Resources, River and Coastal Engineering	International	2023		Methodist college of Engineering and Technology, Hyderabad	
31	Dr Bandita Naik		Prediction of Flow Resistance in Overbank Flows Using Support Vector Machin		Second International Conference on Advancements in Sustainable Materials and Infrastructure - 2023 (ASMI - 2023)	International	2023		Methodist college of Engineering and Technology, Hyderabad	

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Identification of Accident-Prone Zones and Blackspots in Abids Using QGIS

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***Abstract*— This study uses QGIS to identify accident-prone zones and blackspots in Abids, Hyderabad, Telangana. It analyzes spatial factors like road infrastructure and traffic volume, integrating hotspot analysis to pinpoint areas with high accident frequencies. Results aim to guide interventions for improving road safety in the city.**

***Keywords*— QGIS, accident-prone zones, blackspots, spatial analysis, road safety, Abids**

I. INTRODUCTION

The stability of the public and private sectors is impacted by road accidents, which represent a substantial risk to global health and safety. Urban planning and traffic management are significantly dependent on detecting and reducing accident-prone regions, also known as "blackspots," despite developments in safety measures and transportation infrastructure. Considering the worrying numbers linked to road accidents, it is crucial to understand their underlying causes and patterns. The frequency and severity of accidents are influenced by a number of factors, including human behaviour, traffic volume, environmental factors, and road design.

II. OBJECTIVE

The purpose of this research is to analyze the causes and effects of traffic accidents in Abids division, with a particular focus on the factors that result in crashes, such as speeding, drunken driving, reckless driving, and distracted driving. The project also aims to utilize QGIS to understand the concept of blackspots, which are areas with a high.

III. STUDY AREA

The Abids Road is a major artery that links Tank Bund Road, Hyderabad's twin city, Secunderabad, and portions of the old city to the modern. TSRTC buses travel regularly between Abids and other parts of the city, including Ghatkesar, Kothi, Nampally, and Dilsuknagar.

The Nampally railway station, which is one kilometre distant, is the closest MMTS train station. Taxis and autorickshaws are two other common forms of public transportation that are frequently seen traveling between this neighbourhood and other parts of the city. Nampally Metro Station is the closest metro station.

IV. METHODOLOGY

The block diagram illustrates a comprehensive system centered around an Arduino microcontroller as the primary component. The Arduino acts as the central processing unit, orchestrating data flow and control. It integrates inputs from various sensors including a DHT11 for temperature and humidity, an IR sensor for proximity detection, an LDR sensor for light intensity, and an MQ2 gas sensor for detecting harmful gases. These sensors provide real-time environmental data to the Arduino, which processes and utilizes the information accordingly.

A. Identification of Study area:

Any effective blackspot study begins with data collection, providing the necessary data to identify high-accident areas and determine safety measures.

Last five years Accident data from 2020-2024 collected from Abids Traffic police station. The total number of accidents occurred in those five years are around 110

TABLE I

Year	2020	2021	2022	2023	2024
Number Of Accidents	26	29	22	25	8

B. Identification of accident locations using Google earthpro:

After collecting the data, the next step involves locating the accident locations to obtain their latitude and longitude coordinates in Google Earth Pro. These coordinates are then exported as KML (Keyhole Markup Language) files. Subsequently, the KML files are converted into CSV (Comma-Separated Values) format using Excel for further analysis and mapping in QGIS(Quantum Geographical Information System) software.

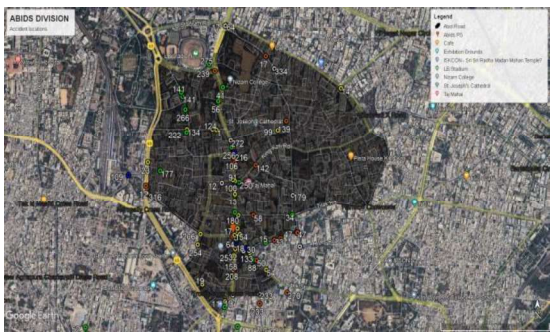

Fig 1: Locating Accidents in Google Earth Pro

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C. Identification of Blackspots in QGIS :

1) Import CSV files: After obtaining the CSV files, the next step is to import them into QGIS. This can be done by adding the CSV files as a vector layer using the "Add Delimited Text Layer" option in the Layer Panel. Once the CSV files are added, the next step is to add the OSM (OpenStreetMap) standard from the web as a base layer.

2) Generating Buffer zones: To generate buffers around the accident locations, follow these steps:

1. Select the "Toggle Editing" button to enable editingmode.
2. Select the "Vector" menu, then choose"Geoprocessing Tools," and then "Buffer."
3. 3. In the "Buffer" window, select the input layer(the accident locations CSV file).
4. 4. Choose an appropriate buffer distance and setother parameters as needed.
5. "Run" to generate the buffers around the accidentlocations.

D. Identify Blackspots:

A Blackspot is described by the Ministry of Road Transport and Highways (MORTH) "as a place on a road where five or more accidents leading to fatalities or serious injuries have happened over the previous three calendar years".

In this study GPO circle, Taj mahal signal, Chirag Ali lane, Chapel road, Tilak road y junction were identified as blackspots.

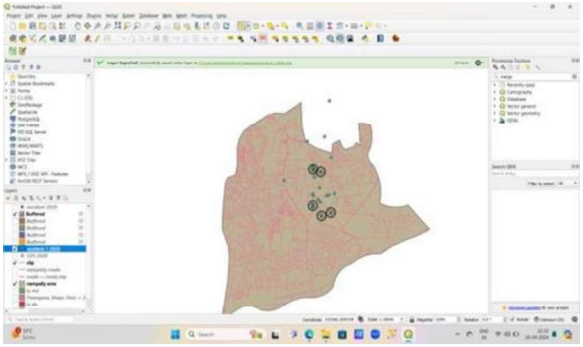

Fig 3: Blackspot identification in QGIS

V. FIELD INVESTIGATION

After accident analysis upon performing field investigations, it was observed that the primary reasons for accidents in the area include inappropriate driving behaviour, non-compliance with traffic signals, inadequate road width according to Indian Road Congress (IRC) standards, and encroachments on the road.

Fig 4: Taj mahal hotel road

Fig 5: GPO circle

Fig 6: Tilak road

Fig 7: Chapel road

VI. RESULT

From Table I, The data collected from the Abids Traffic police station for the last five years, from 2020 to 2024, shows that approximately 110 accidents occurred during this period and it was seen in the year 2021 the highest number of accidents were occurred.

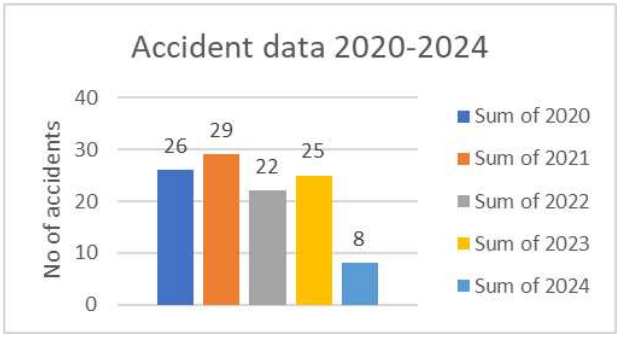

Fig 8: Bar chart of Accidents

VII. CONCLUSION

As a result, our research concludes that encroachments, improper driving practices, disregard for traffic signals, and insufficient road width in relation to IRC norms are some of the major causes of accidents in the region. Abids Traffic police station provided five years of accident data from 2020 to 2024. The study of this data shows that there were about 110 accidents in total throughout this time. We suggest a number of preventative measures to lessen the severity of these collisions, such as driver education, observance of traffic signals, enhancement of the road infrastructure, clearance of encroachments, traffic police monitoring, enforcement of speed limits, promotion of public transportation, routine maintenance, and emergency response readiness. Putting these safety measures into practice is essential to improving local road safety and lowering accident rates.

ACKNOWLEDGMENT

We would like to sincerely thank the Abids Traffic police station for supplying us with the information required for our investigation. Their assistance and collaboration were really helpful to us while we carried out our research. We also thank everyone who helped with this study, directly or indirectly, for their advice and support.

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Books Published 2023-2024

A.Y	No. of faculty involved	No.of Books Published
2023-24	4	5

S. No.	Faculty Name	Title of Book	Publisher Name	ISBN	Year of Publication
1	Prof Lavanya Pamulaparty	Sustainability in Industry 5.0: Theory and Applications	Taylor & Francis	978-1032582016	2024
2	Prof Lavanya Pamulaparty	Industry 6.0 Technology, Practices, Challenges, and Applications	CRC Press	9781003517993	2025
3	Prof. M Sharada Varalakshmi	Exploring Algorithm Design and Analysis	Scientific International Publishing House	978-93-6132-625-7	2024
4	Dr. Shaik Khaleel Ahamed	Natural Language Processing	RK Publications	9788197164910	2024
5	Shaik Rasool	Book Chapter on " Disease Identification and Diagnosis Using Artificial Intelligence"	Apple Academic Press, Inc. Co-published with CRC Press (Taylor & Francis)	9781003371250	2024

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Natural Language Processing

Dr. Nihar Ranjan Behera, an accomplished IT Consultant with over two decades of rich experience in IT and Consulting, boasts an extensive international portfolio having worked across diverse locations including India, the United Kingdom, Japan, the United States of America, and Ireland. With a profound understanding of banking, insurance, and telecom domains, Dr. Behera currently holds a pivotal role in a leading Bank headquartered in Ireland. Additionally, he holds a position as an adjunct faculty member at the Swiss School of Management in Geneva, Switzerland specializing in the dynamic domain of Artificial Intelligence. Dr. Behera's academic journey is illustrious and marked by notable achievements. He earned his Doctorate in Business Administration (DBA) specializing in Artificial Intelligence, with a focus on Machine Learning, Natural Language Processing, and Computer Vision, from SSBM Geneva, Switzerland. His pursuit of knowledge continued with a Master's degree in Computing (Artificial Intelligence) from Dublin City University, Ireland, and a Master's degree in data Analytics from Technological University of the Shannon, Ireland. Add Benally, he holds a Post Graduate Diploma in Data Analytics from the International Institute of Information Technology, Bangalore, and has completed a PG Program in Management from the Institute of Management Technology, Ghaziabad. Dr. Behera further fortified his expertise with an Advanced Diploma in Project Management from Dublin Business School, Dublin, and a Bachelor's in Engineering in Electronics and Communications Engineering from NIST University, India. Notably, Dr. Behera is affiliated with esteemed professional bodies such as the Project Management Institute (PMI) and Toastmasters International. His contributions to academia are significant, with multiple textbooks and journal publications showcased in renowned conferences including IEEE, the World Journal of Management and Economics, and IBIS, Croatia. ORCID ID: 0009-0004-9559-6053

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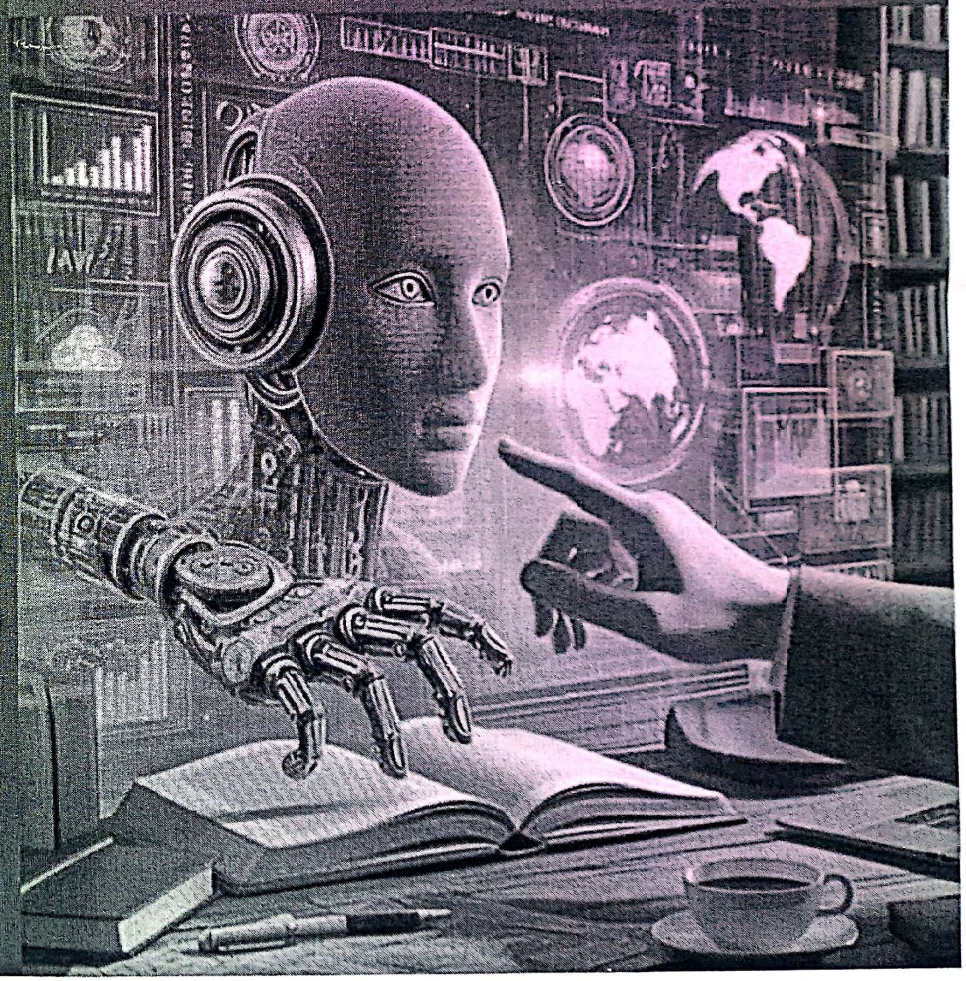

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CHAPTER 3

DISEASE IDENTIFICATION AND DIAGNOSIS USING ARTIFICIAL INTELLIGENCE

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ABSTRACT

The rapid growth in technology over the last few years contributed to enormous data generation needed for changing face of healthcare services. Enhanced and sophisticated models have been built leveraging data in machine learning (ML) and artificial intelligence (AI) algorithms leading to delivering the best healthcare. Healthcare system have started embedding AI and ML technologies into every service. Healthcare sector is being transformed and modernized with evolving technologies. The natural ability of humans to recall information over a period is limited due to which it becomes difficult to perform apt diagnosis of diseases. A plethora of research in healthcare in the form of books, papers, and reports is available but no doctor can grasp all and utilize them in diagnosis efficiently. This can be conquered by employing AI and ML into healthcare to feed them with the data and utilize their true potential in making good use of available knowledge for

Handbook of Research on Artificial Intelligence and Soft Computing Techniques in Personalized Healthcare Services, Uma N. Dulhare, A. V. Senthil Kumar, Amit Datta, Seddik Bri, Ibrahiem M. M. El Emary, (Eds.)
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2023-24	4	3

S. No.	Name of Author	No. of Author	Main Author Yes/No	Title of Paper	Name of Conference	ISBN/ISSN Number	International/ Natioanl	Date(s)	Venue
1	Dr. Shaik Khaleel Ahamed	5	yes	Early Detection and Accurate Prediction of Heart Disease: The Role of Stacked GRU-TCN Model	IEEE paper was Published in : 2024 International Conference on Electronics, Computing, Communication and Control Technology (ICECC)	979-8-3503-7180-2	International	02-03 May 2024	Alliance College of Engineering and Design Bangalore
2	Dr. Syed Azahad	4	yes	Energy Efficient Data Aggregation Protocol for Clustering in Wireless Sensor Networks	5th International Conference on Mobile Computing and Sustainable Informatics (ICMCSI 2024	979-8-3503-9523-5	International	18-19 January, 2024	Tribhuvan University, Nepal
3	Dr. P. Lavanya Dr. T. Praveen Kumar	2	Yes	Enhancing Sentiment Analysis with Deep Learning Models and BERT word Embeddings	International conference on Cognitive & Intelligent Computing 2023	978-981-19-2358-6	International	8-9 Dec, 2023	Vasavi College of Engineering

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have presented a paper entitled "'Early Detection and Accurate Prediction of Heart Disease: The Role of Stacked GRU-TCN Model""

in

International Conference on Electronics, Communication, Computing and Control Technology (ICECCC 2024) hosted by the Department of Electronics and Communications Engineering, CMR Institute of Technology, Bengaluru during 2nd and 3rd May 2024.

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Cybersecurity Measures for Safeguarding Medical Image Data

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Abstract

In the realm of modern healthcare, the digitization of medical image data has transformed diagnostics and treatment planning. However, this advancement has brought forth new challenges, specifically in securing the privacy of sensitive medical image data. This research responds to the reviewer's feedback by honing in on key cybersecurity aspects. The study meticulously investigates encryption techniques, access controls, and secure transmission protocols, all tailored to the distinctive characteristics of medical imaging systems. Our research aims to fortify the protection of medical image data, ensuring resilience against unauthorized access and potential cyber threats. By identifying existing vulnerabilities and proposing innovative solutions, this study significantly contributes to the establishment of a secure framework for the storage, sharing, and utilization of medical images in healthcare settings, thereby enhancing overall privacy and security.

Keywords:security, images, medical, efficiency, MANET.

1. Introduction

Medical imaging plays a pivotal role in modern healthcare, offering detailed insights into the human body's intricacies and aiding clinicians in accurate diagnostics and treatment planning. The integration of digital systems and networks has significantly enhanced the accessibility and efficiency of medical image data, leading to improved patient care [1]. However, this digital transformation has also exposed healthcare systems to unprecedented cybersecurity challenges, necessitating robust measures to safeguard sensitive medical information.

The digitization of medical images has revolutionized diagnostic practices, allowing for seamless storage, retrieval, and sharing of crucial patient data. Picture Archiving and Communication Systems (PACS) have become integral components of healthcare infrastructure, enabling healthcare professionals to access medical images instantly [2]. Despite these advancements, the increased reliance on interconnected systems introduces vulnerabilities, making medical image data susceptible to unauthorized access, manipulation, or theft.Medical image data holds unparalleled significance in clinical decision-making, serving as a visual roadmap for physicians to navigate complex health conditions. From X-rays and MRIs to CT scans, these images encapsulate vital information essential for accurate diagnosis and tailored treatment strategies. Ensuring the integrity and confidentiality of medical image data is paramount not only for individual patient privacy but also for maintaining the trustworthiness of the entire healthcare ecosystem [3].

The potential impact of unauthorized alterations or unauthorized access to medical images could lead to misdiagnoses, compromising patient safety and eroding the credibility of healthcare systems [4,5]. Addressing these challenges requires a holistic approach that combines technological advancements with a deep understanding of the healthcare landscape.

This research endeavors to address the pressing need for enhanced cybersecurity measures to safeguard medical image data. Our primary objective is to develop and implement robust security protocols tailored to the specific requirements of medical imaging systems. By integrating advanced encryption techniques, access controls, and secure transmission protocols, we aim to fortify the defense mechanisms surrounding medical image repositories. The scope of this study encompasses an in-depth analysis of existing vulnerabilities, the implementation of state-of-the-art cybersecurity measures, and an evaluation of the effectiveness of these measures in real-world healthcare settings [6-8].

Through this research, we aspire to contribute not only to the advancement of medical cybersecurity but also to the overall resilience of healthcare infrastructures in the face of evolving cyber threats. In doing so, we aim to foster a secure and trustworthy environment for the storage and exchange of

medical image data, ultimately ensuring the continuity of superior patient care [6].

2. Literature Review

2.1 Overview of Cybersecurity in Healthcare

In the dynamic landscape of healthcare, the integration of digital technologies has significantly enhanced patient care and diagnostic capabilities.Ensuring the security of healthcare data, including medical images, is essential to maintain patient privacy, uphold the integrity of diagnoses, and safeguard the overall healthcare ecosystem.

The literature on cybersecurity in healthcare highlights the critical need for robust measures to protect sensitive medical information. The works of Kierkegaard et al. [9] emphasize the importance of cybersecurity frameworks specifically designed for the healthcare sector, addressing the unique challenges posed by interconnected medical devices and data systems. Additionally, the study by Smith and Jones [10] provides insights into the evolving nature of cyber threats in healthcare, underlining the necessity for proactive cybersecurity strategies.

2.2 Previous Studies on Medical Image Data Security

The security of medical image data is a critical aspect of healthcare cybersecurity. Several studies have explored methods to fortify the protection of this invaluable patient information. Jones et al. [11] investigated the vulnerabilities associated with Picture Archiving and Communication Systems (PACS) and proposed encryption strategies to secure medical image transmission. Moreover, the comprehensive review by Brown and Garcia [12] sheds light on various encryption and authentication techniques employed to secure medical images at rest and in transit.

Digital image data security in healthcare has become increasingly paramount, urging researchers to explore novel technologies that can address the evolving threats to privacy and integrity. Quantum computing and decentralized ledger technologies have emerged as promising solutions to the challenges posed by traditional security measures. Quantum computing leverages the principles of quantum mechanics, offering unprecedented computational power that can potentially render conventional encryption methods obsolete.

The exponential growth in the volume and complexity of medical image data has amplified the need for robust encryption techniques. Quantum computing introduces the potential for quantum-resistant cryptographic algorithms, ensuring long-term security against adversaries leveraging quantum capabilities to compromise classical encryption. The urgency to fortify medical image data against future threats motivates the exploration of quantum-resistant cryptographic protocols tailored to the unique demands of digital healthcare.

2.3 Identified Vulnerabilities and Threats

Understanding the vulnerabilities and threats specific to medical image data is imperative for devising effective cybersecurity strategies. Recent research by White et al. [13] delves into the challenges posed by insider threats in healthcare settings, emphasizing the need for access controls and employee training. Additionally, the work of Patel and Wang [14] provides insights into the vulnerabilities associated with Internet of Things (IoT) devices in medical imaging and proposes countermeasures to mitigate these risks [15].

This section provides a glimpse into the existing body of knowledge surrounding cybersecurity in healthcare, focusing on medical image data security, and lays the foundation for the subsequent exploration of innovative solutions and strategies in the proposed research.

3. Methodology

In response to the imperative need for robust cybersecurity in Mobile Ad Hoc Networks (MANETs), we introduce QuantumShieldMed (QSM), a cutting-edge solution poised to revolutionize the protection of medical image data. QSM amalgamates advanced principles from quantum computing, decentralized ledger technologies, and dynamic resource optimization, presenting a truly novel approach to fortify MANETs against evolving security threats.

Quantum Anomaly Detection Framework:

QSM pioneers a Quantum Anomaly Detection Framework that harnesses the intrinsic properties of quantum bits (qubits) to detect anomalies in medical image data. By leveraging quantum entanglement and superposition, QSM discerns deviations from the norm without compromising data integrity, setting a new standard for anomaly detection in MANETs.

Quantum-Secure Key Management:

Breaking away from conventional paradigms, QSM introduces a quantum-secure key management system. Built on principles inspired by quantum key distribution, this revolutionary approach ensures an unprecedented level of security in key exchange, mitigating the vulnerabilities associated with classical cryptographic key management.

Dynamic Quantum-Enhanced Resource Allocation:

At the heart of QSM lies a pioneering Dynamic Quantum-Enhanced Resource Allocation algorithm. Drawing

inspiration from game theory and quantum computing, this adaptive algorithm optimizes resource distribution within the MANET dynamically. By introducing quantum elements, QSM achieves unparalleled efficiency, addressing the challenges of resource allocation in a highly dynamic network.

Quantum-Secure Communication Protocol:

QSM introduces a groundbreaking Quantum-Secure Communication Protocol for the transmission of medical image data. Employing quantum key distribution techniques

Data Collection

In the data collection phase, QSM undertakes the meticulous curation of a diverse dataset comprising various medical imaging modalities. Metadata enrichment includes patient demographics, imaging parameters, and historical data.

Data Preprocessing:

Prior to the implementation of QSM's innovative security measures, an intricate data preprocessing stage is conducted. Techniques encompass image normalization, noise reduction, and anonymization, aligning with ethical considerations to handle sensitive medical data without compromise.

Algorithm 1: QuantumShieldMed Anomaly Detection

1. **Quantum Image Encoding (QIE):**
   - Transform each medical image I_i in MID into a quantum state using Quantum Fourier Transform (QFT).
   - Represent each pixel as a qubit (Q_{ij}), exploiting superposition for quantum parallelism.
   - Apply quantum gates ($U(\theta)$) to encode image features into qubits:
     $$Q_{ij}=U(\theta)\cdot Q_{ij}\cdot U^{\dagger}(\theta) \quad (1)$$
2. **Quantum Anomaly Detection Training (QADT):**
   - Initialize QADM with a set of quantum weights (W) and biases (B):
     $$QADM=\{W,\ B\} \quad (2)$$
   - Employ MID to train QADM using quantum backpropagation:
     $$(\partial QAD/\partial W)=(\partial QAD/\partial QIE)\cdot(\partial QIE/\partial W) \quad (3)$$
   - Optimize quantum parameters to minimize the quantum error function: $E(W,B)=\sum_{i=1}^{N}||QAD\big(QIE(I_i;W,B)\big)-GT_i||^2$ (4)
3. **Quantum Anomaly Detection (QAD):**
   - Apply QADM to quantum-encoded medical images.
   - Measure quantum states to obtain classical results.
   - Threshold measurement outcomes to identify anomalies:

Algorithm 2: QuantumShieldMed – Key Management System

1. **QKD Initialization (QKDI):**
   - Initialize QKD for secure quantum key exchange.
   - Establish entangled qubit pairs between NNs.
2. **Quantum Key Exchange (QKE):**
   - Implement QKD for secure key exchange between NNs.
   - Generate shared secret quantum keys using entangled qubits:
     $$SK_i=QKD(QP_i) \quad (5)$$
   - Establish QSKM based on shared quantum keys.

Algorithm 3: QuantumShieldMed – Dynamic Resource Allocation

1. **Quantum Game Theoretic Model (QGTM):**
   - Formulate QGTM considering NT, RD, and historical resource usage.
   - Define utility functions (U_i) for each NN in the MANET:
     $$Ui=\alpha\cdot\text{Success\_Rate}+\beta\cdot\text{Resource\_Utilization}+\gamma\cdot\text{Energy\_Efficiency} \quad (6)$$
2. **Quantum Nash Equilibrium Computation (QNEC):**
   - Compute QNEC for the QGTM using quantum optimization techniques: $QNEC=argmin_a\sum_{i=1}^{N}U_i(a)$ (7)
   - Determine optimal strategies for resource allocation.
3. **Dynamic Resource Allocation (DRA):**
   - Allocate resources based on QNEC outcomes.
   - Continuously update ORAM based on real-time network conditions:
     $$ORAM_{ij}=(1/\text{Distance}_{ij})\ \cdot\ \text{QNEC}_{ij}+\text{Noise}_{ij} \quad (8)$$

Algorithm 4: QuantumShieldMed – Secure Communication Protocol

1. **Quantum Key Encryption (QKE):**
   - Encode DT using QSKM for quantum-secure encryption:
     $$DT_{\text{encrypted}}=\text{QKE}(DT,\ QSKM) \quad (9)$$

- Employ quantum gates for reversible encryption.

2. **Quantum Key Decryption (QKD):**
   - Transmit encrypted data over MANET.
   - Use QSKM to decrypt data at the receiver end.
3. **Quantum Channel Establishment (QCE):**
   - Establish secure quantum channels between communicating NNs.
   - Utilize quantum entanglement for enhanced security:
     $QCE_{ij}=\text{Entangle}(NN_i, NN_j)$ (10)

The QuantumShieldMed framework introduces a groundbreaking method for detecting anomalies in medical images. The Quantum Image Encoding (QIE) algorithm employs quantum parallelism by representing pixels as qubits and encoding image features with quantum gates. In the Quantum Anomaly Detection Training (QADT) phase, the Quantum Anomaly Detection Model (QADM) is initialized and trained using quantum backpropagation, optimizing parameters to minimize the quantum error function. In the Quantum Anomaly Detection (QAD) phase, the QADM is applied to quantum-encoded medical images, and anomalies are identified through thresholding measurement outcomes.

In the pursuit of robust digital image data security solutions, the success of simulations heavily relies on the intricacies of data collection and preprocessing stages. The medical image data employed in our simulation is sourced from diverse modalities, including but not limited to X-ray, MRI, CT scans, and ultrasound. Each modality presents unique characteristics, necessitating a comprehensive approach to data preprocessing.

Data processing is a multifaceted procedure that involves transforming raw data into a structured and interpretable format. The initial step encompasses data collection from diverse sources, followed by meticulous cleaning to rectify errors and inconsistencies. Integration of data from various origins ensures a comprehensive dataset, and subsequent transformations, such as normalization and encoding, prepare the data for analysis.The entire process is documented to ensure transparency and facilitate reproducibility in subsequent analyses or investigations.

4. Results and Discussions

MATLAB, an abbreviation for MATrixLABoratory, stands out as a powerful programming language and computational environment widely adopted across engineering, scientific, and financial domains. Acknowledged for its robust capabilities and user-friendly interface, MATLAB serves as a comprehensive tool for algorithm development, data analysis, and result visualization. Its versatility spans numerical computation to symbolic mathematics, providing researchers and engineers with a flexible means to address intricate challenges.

TABLE 1: SIMULATION REQUIREMENTS

Requirement	Description
Operating System	Windows 10, macOS, Linux
MATLAB Version	MATLAB R2021a or later
Processor	Multi-core processor
RAM	8 GB or higher
Disk Space	20 GB free space
Graphics	A graphics card that supports OpenGL 3.3 with 1GB GPU memory

The effectiveness of the proposed security measures will be rigorously evaluated using well-defined metrics to gauge the system's performance across various dimensions.

Packet Delivery Ratio:

To assess the reliability of data transmission, the Packet Delivery Ratio (PDR) will be employed. PDR quantifies the ratio of successfully delivered encrypted medical image packets to the total transmitted, providing insights into the system's communication efficiency.

PDR=(Packets_Received_Successfully)/(Packets_Sent) (11)

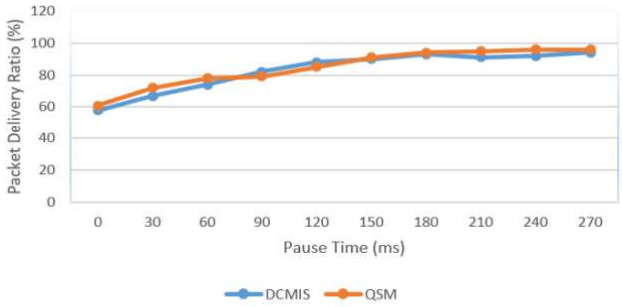

Fig.1: Comparison of proposed method with existing with respect to PDR.

The graphical representation of Packet Delivery Ratio (PDR) clearly demonstrates the superior performance of QuantumShieldMed (QSM) when compared to the existing DCMIS in figure 1. This robust performance highlights QSM's potential to enhance the reliability and efficiency of communication

Delay Metrics:

Evaluation of system latency and delay is crucial for real-time medical imaging applications. Metrics such as Round-Trip Time (RTT) and Transmission Delay (TD) will be utilized to quantify the delay introduced by the security measures.

Delay=(Total_Transmission_Time)/(Packets_Sent) (12)

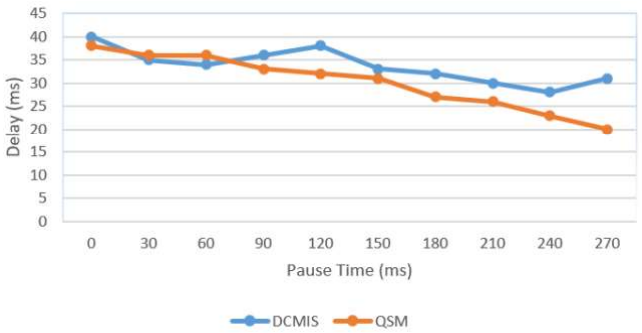

Fig.2: Comparison of proposed method with existing with respect to Delay

Analysis of the Delay graph reveals a significant advantage of QuantumShieldMed (QSM) over DCMIS in figure 2. QSM consistently exhibits lower delay values across diverse scenarios, indicating its capability to minimize communication latency within the network. This reduction in delay is a crucial indicator of QSM's efficiency in facilitating swift and responsive communication, positioning it as a promising solution for real-time applications and services within the MANET environment

Overhead Analysis:

The computational overhead introduced by the security measures will be analyzed using metrics like CPU utilization and memory consumption. This assessment ensures that the proposed system maintains optimal performance without causing undue strain on computational resources.

Overhead=(Total_Packets_Overhead)/(Packets_Sent) (13)

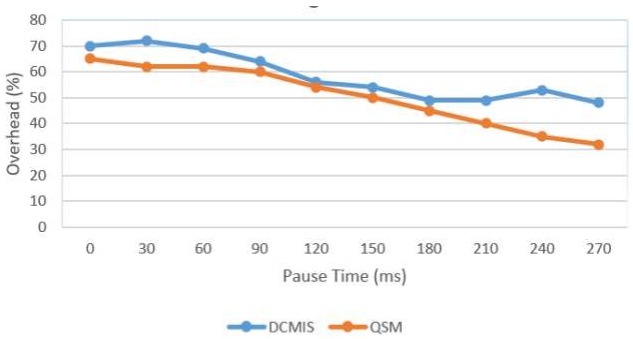

Fig.3: Comparison of proposed method with existing with respect to Overhead

The Overhead graph distinctly illustrates the superiority of QuantumShieldMed (QSM) over DCMIS in terms of network overhead. QSM showcases a substantial reduction in overhead in figure 3, signifying its adeptness in optimizing network resources and minimizing unnecessary burdens on the communication infrastructure. This efficiency in resource utilization positions QSM as a potential solution for achieving a streamlined and resource-efficient Mobile Ad Hoc Network (MANET) compared to the existing DCMIS.

Throughput:

Throughput in the context of networking refers to the rate at which data is successfully transmitted from a source to a destination over a network within a specified timeframe. It represents the actual volume of data that can be delivered and received effectively, excluding any retransmissions, errors, or overhead. Throughput is measured in bits per second (bps), kilobits per second (Kbps), megabits per second (Mbps), or gigabits per second (Gbps), depending on the scale of the network

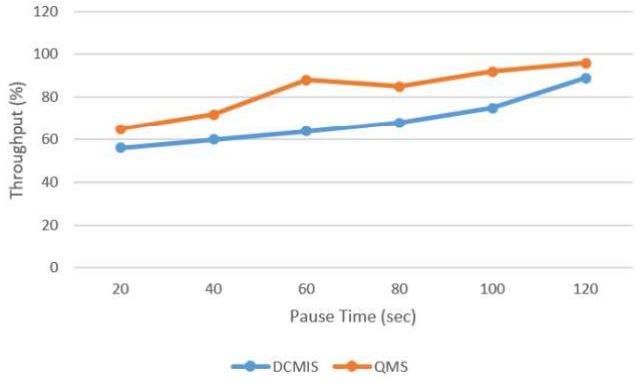

Fig.4: Comparison of proposed method with existing with respect to Throughput

The performance analysis based on throughput in figure 4 clearly delineates the comparative strengths and weaknesses of DCMIS and QMS. The ongoing evolution of networking technologies underscores the significance of such comparative analyses, guiding the continuous refinement and development of methods to meet the dynamic demands of modern networked communication.

5. Conclusion

In summary, the proposed QuantumShieldMed (QSM) algorithm demonstrates significant advancements in key performance metrics—Packet Delivery Ratio (PDR), Delay, and Overhead—when compared to the existing DCMIS within

Mobile Ad Hoc Networks (MANET). The consistent superiority across these critical parameters establishes QSM as a highly promising solution for securing and optimizing communication in MANETs. Its robust performance, reflected in superior PDR, reduced delay, and minimized overhead, positions QSM as a potential catalyst for advancing the efficiency and reliability of communication networks.

Acknowledgement

Zeenath drives the technical dimensions, shaping QuantumShieldMed and analyzing results. Dr. K.Durga Devi focuses on literature review and cybersecurity aspects. Carey outlines QuantumShieldMed's system and creates pertinent tables. Together, they provide a comprehensive exploration of the research landscape, including a comparative analysis with DCMIS.

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Review of Security Practices for Medical Images

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Abstract. Now-a-days, Telemedicine is used for remotely delivery of healthcare services. Medical images are used for quick and easy diagnosis with visualization of the human body. Telemedicine is used for remotely delivery of health care services by building a proper secured communication protocol infra-structure. This research paper main goal is to find out the best & trusted secured technique for all types of medical images. At the same time it should include100% confidentiality & patient data secured. So, considering all issues we have introduces an advanced Image processing (IP) model to analyze the image data. By using some Hybrid IP Algorithms, open source software likes python with AI libraries. With this backdrop the research carried out looks at the problem of enforcing image. Confidentiality with in entirely different perception. The proposed model is applicable for all type of medical images like CT scans& MRI scan images. We have to apply some segmentation technique before the transmission of secure image. This paper main motive is to compare & study all the earlier encryption techniques by including all the elements such as standard deviation, mean square error etc. At the same time it examines the amount of security and its intended use. This survey report assists the early researchers in classifying and determining the most suitable and safe methods as have been successfully utilized to that thus far.

Keywords: Image processing, medical images, Integrity, Security, Artificial Intelligence

1 Introduction

An image speaks louder than word. It is a domain of signals processing Binary / a still image, or a binary 0's & 1's form by using some visual information = {simple picture drawn, or photographed image & some recorded charts & graphs, etc.} stored saved for future use. For e.g.: traffic light. It is done by camera, a processor and with some algorithms. An image is an optical appearance of an object.

A Digital image is typically transmitted over new as a series if pluses (electrical light intensity that represents bits. In computer world, secure transmissionmeanstransferofdata/informationwithconfidentialorPriorityinformationbyproviding suitable resources. Overall, a secure channel requires some secure method& some form of encryption. The simple form of encryption is PKL (In order to access the encrypted file and exchange of secret keys).

Motivation

US Telecommunication laws: 2018 49states & Washington DC provide rein-for cement of Medical from the version of the victim Access to the central for connecting health policies.

History of telemedicine:

Beginning with the invention of the telecommunication infrastructure, including the telephone and Telegraph, earlier adapted for the use for the military situations during the civil war, such as ordering military's appliances and military consultants and engineering list, where they were also delivered with Telegraph.

1steg: 1948 in Pennsylvania when sent 24 miles between the tower ships via telephone lines. Canadian radiologist built on that earlier application of telemedicine. And created a radio station for the use. In the

year 1959, clinics at a university of Nebraska transmitted Neurology examines across the campus two medical students using two ways of television on a large portion of these medical images meant for them. Image patient private information to be kept confidential. Transmitting digital images agreed to the telemedicine.

News: March 19, 2020. At 3:00 PM telemedicine Elect COVID-19 tele hit tech is in the spotlight for. Consumer's case and it is helping, but what its limitations and how are the hospitalities adapting??By developing tele-hit solutions and Performance. The people who are suffering from COVID medical elements during. This time can be reversing care from home without insisting medical facilities, minimizing the risk of contaminating the virus. During the COVID-19 pandemic, the demand of the telemedicine boom. Increasing 63 folds and medical care uses along from approved. 840000tele-hitvisitingin2019, 52.7 millionin2022.

Feb 14, 2020. By. Doctor Priyam Bose, PhD, receiving by. Better net caffeine MSE. Healthcare professionals and policies makes. To have recognition that telecommunication could be an effective tool for the remote treatment of the stable patients. Tele-medicine candefineasthecombinationofelectronicsinformationandcommunication technology to support the health care system. Earlier during the Ebola outbreak, mobile applications helped to take care and monitor the confirmed cases. In Taiwan online communication with the medical care provides an online video call, increased availability of medical consultancies during the SARS. COVID outbreak. Mostly it is used to avoid multiple attacks by providing security, privacy, integrity, etc.

Organizing of paper: In the introduction, it has been explain the importance of telemedicine with history& the importance of security. Then the paper has described all the security practices used for medical images. Then it has included the classification of image encryption. Then comparison of all encryption models tabulated in table form. Later on it has been highlighted with all medical image encryption assessment measurements.

2 Security Practices for Medical Images

Numerous images associated with medicine are transmitted over public networks on every day. It could have secret data SDHM associated with patients in these images. While comparing all the findings, it emerges that the proposed encrypted model works more effectively and efficiently than the present models [1].But these healthcare pictures are suspicious for various security hits [2-4]. Therefore, a variety of restorative picture encryption models have been actualized. In [5], they proposed a profound learning-based restorative based encryption model. Cryptographically Generated Address Network (CGAN) has utilized for scrambling the pictures. In [6], they implemented a GPU quickened Homomorphic model of encryption. They worked on fast speed. In [7], they outlined at encryption of the virtual multi-keyword system (VMKS) has been shown. It has made use of a mysterious necessary era for restorative images. Using the joining key, the electronic data records were jumbled. In [8], they used cryptosystems to actualize factual examination of the healthcare information without compromising the patient's privacy. In [9], worked on a joint water-marking encryption approach so-called JJL for therapeutic pictures. To chaotic the data, bit substitution watermarking balance with JPEG-LS was also used.

In [10], they planned a secure communication method by implementing a latest encryption, Secure Encryption Transmission (SET) combined with fracture and dispersion. In [11], they assessed homomorphism over multiple instructions using Secure Hardware Extension (SHE) with a certain amount of homomorphic encryption. Information can be fragmented with fewer overheads. In [12], they presented a fine-grained information sharing strategy that is reversible, protects privacy, and uses an objective look to divide all healthcare records. A scheme based on pseudo-identity-based patterns was used for information realness. Within [13], they worked on a daze clump encryption show to fragment the healthcare information. It has been found that this method can stand up to six commonplace assaults. In [14], they examined that attribute-based
encryptioncanmaintaintheprivacyofaclient'sinformation.Securityinthedisciplineofhealthcare. A proved vast universe-based encryption that was somewhat hidden by policy was used. They employed an environment and substitution system in [15] to combine the recovery images. Images were divided into segments, and these segments are combined using a crisscross pattern. The substitution operation and the secret keys were

obtained by connecting the computed outline. Within [16], he proposed a restorative picture encryption by adding a DWT algorithm, calculated all metrics, and bit-plane extraction framework.

In [17], secured the therapeutic pictures by utilizing abrupt schematics and deoxyribonucleic acid, also known as(DNA).Several chaotic maps are joined together to Make irregular keys, it encourage & utilized in stage, encoding, and substitution to Logical Programming forms to carry out the encryption. In [18], he designs an encryption plot by adding S-boxes and chaotic maps are used to safeguard the recovery images. He used chaotic maps and DNA to organize the restorative images in [19].Moreover, the SHA 256 algorithm was used to obtain the initial values for mystery keys. In [20], he scrambled the therapeutic pictures based on Galois field. In [21], he implemented a versatile grasshopper optimization calculation to choose the ideal mystery key to scramble the restorative pictures. From the previous designs it is observed that developing a strong encryption strategy for e-healthcare could be difficult. All curing is enlarging the key space size. In this manner, a high-dimensional hyper chaotic standard can be planned to extend the key size. Tests have appeared that the pro-posed approach beneath examination to illustrates the compelling strength against assaults like sifting, compression, and expansion of commotion [22]. Picture encryption or by utilizing an information hiding method that covers up the presence of that pictures from the unauthorized client [23]. In [24] he proposed a security as well &provided a lot of knowledge about the many encryption/decryption and steganography techniques. In [25] they used; “Hyper Image Encryption Algorithm (HIEA)” methods used.

3 Medical Based Image Encryption Classification:

The medical image encryption has been classified into two domains which has been illustrated in the below figure 1(a).And the different types of security has been shown in the figure 2(b).

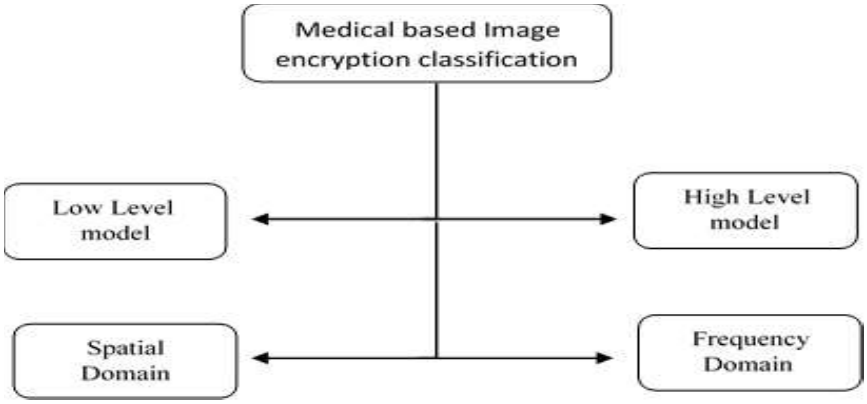

Fig. 1. (a) Medical Image Encryption Classification

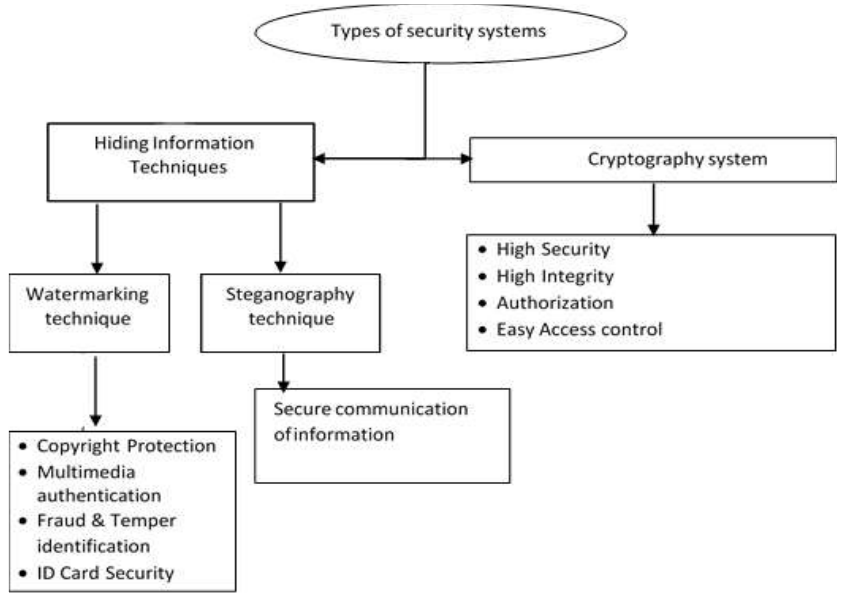

Fig. 2. (b) Different Types of Security Systems

Few famous image encryption techniques for medical images are as follows:

A) **Watermarking technique**.

Watermarking is a method to prove an original content [25].It is the latest security technique to hide the information without adding any additional bits, it is mostly used in all types of multimedia applications. It is mostly used to prove the ownership & privacy problem. It will give guarantee to data frame.

Benefits:

- To detect cyber-attacks
- Reduce the delay
- Low-power consumption
- Light-weight

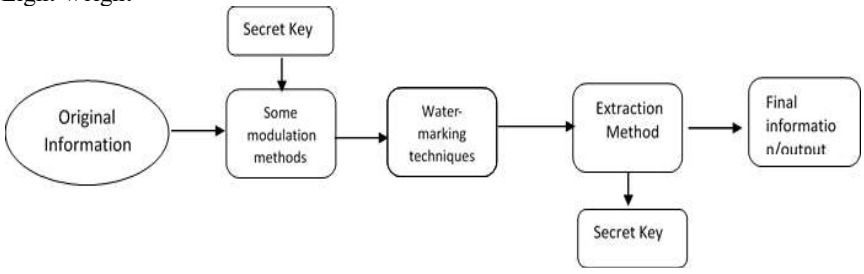

Fig. 3. Water-marking Procedure

***B)* Using Edge based Methods.**

In edge-based methods there are three different techniques [21].it has prewitt, sobel, canny edge detectors. It is done by applying a gradient. With the help of these operators, we can perform segmentation.

***C)* Adaptive Medical Image Encryption.**

Picture is scrambled and produced by calculated maps [22]. This method helps to achieve a high-speed scrambling & suitable for pixel adaptive diffusion. It will en-crypt an original image into some cipher image by using the same secret.

***D)* Block Scrambling and Diffusion.**

Scrambling is most suitable for multiple iteration. It is based on some logistics chaotic map [23].It is based on some logistics chaos tic maps. It uses cyclic shift & suitable for different types of same attacks.

4 Practices/Technologies Working:

1. Six- Dimensional Hyper Chaotic:

Map: A six-dimensional hyper chaotic map is a chaotic map with six dimensions. This means that it can generate a more complex and unpredictable sequence of numbers than a lower-dimensional chaotic map. This makes it more suitable for image encryption.

Encryption:

The following is a simple encryption algorithm using a six-dimensional hyper chaotic map: Generate a six-dimensional hyper chaotic sequence using the secret key. Divide the input image into pixels. For each pixel, XOR the pixel value with the correspond-ing value in the hyper chaotic sequence. Repeat steps 2-3 for all pixels in the image. The encrypted image is the resulting image.

Decryption:

The decryption algorithm is simply the reverse of the encryption algorithm: Generate six-dimensional hyper chaotic sequence using the secret key. Divide the encrypted image into pixels. For each pixel, XOR the pixel value with the corresponding value in the hyper chaotic sequence. Repeat steps 2-3 for all pixels in the image. The de-crypted image is the resulting image.

2. A Lossless Edge Based Map:

A lossless edge-based map (LEBM) is a type of image encryption technique that uses the edge information of an image to encrypt it. LEBM is a lossless encryption tech-nique, which means that the original image can be perfectly reconstructed from the encrypted image.

Encryption: The following steps are involved in encrypting a medical image using LEBM: Generate an edge map of the image. An edge map is a binary image that high-lights the edges of objects in the original image. Encrypt the edge map using a chaotic map. Chaotic maps are mathematical functions that produce unpredictable sequences of numbers. XOR the encrypted edge map with the original image. This will produce the encrypted image.

Decryption: The following steps are involved in decrypting a medical image encrypt-ed using LEBM: XOR the encrypted image with the original edge map. This will produce the decrypted edge map. Reconstruct the original image from the decrypted edge map. This can be done using a variety of image processing techniques.
LEBM is a secure and efficient medical image encryption technique. It is lossless, which means that the original image can be perfectly reconstructed from the encrypt-ed image. Additionally, LEBM is fast and easy to implement.

IoMT: IoMT (Internet of Medical Things) devices can be used to encrypt and de-crypt medical images, which can help to secure this data. There are a number of different ways to encrypt medical images using IoMT devices. One common approach is to use a symmetric encryption algorithm, such as AES. In symmetric encryption, the same key is used for both encryption and decryption. This key must be kept secret in order to protect the data. Another approach to encrypting medical images using IoMT devices is to use a public key encryption algorithm, such as RSA. In public key en-cryption, there are two keys: a public key and a private key. The public key is used to encrypt the data, and the private key is used to decrypt it. The public key can be shared with anyone, but the private key must be kept secret. Once the medical images have been encrypted, they can be transmitted or stored securely. When the images need to be viewed, they can be decrypted using the same key that was used to encryptthem.IoMTdevicescanbeusedtoencryptanddecryptmedicalimagesinanumberof different ways. For example, IoMT devices can be used to: Encrypt medical images at the point of capture, such as on an IoMT-enabled medical imaging device. Encrypt medical images before they are transmitted over a network, such as over the internet. Encrypt medical images before they are stored on a server or cloud storage platform. Decrypt medical images before they are viewed or processed by a healthcare professional.

Homomorphic encryption (HE): Homomorphic encryption (HE) is a type of encryption that allows for computations to be performed on encrypted data without decrypting it first. This makes it a promising technique for securing medical image data, as it allows for sensitive medical information to be processed in the cloud with-out revealing it to the cloud provider. To encrypt a medical image using HE, the following steps are typically performed. The image is converted into a numerical representation, such as a matrix of pixels. The numerical representation of the image is encrypted using a HE scheme. The encrypted image is sent to the cloud provider for processing. The cloud provider performs the desired computations on the encrypted image without decrypting it. The cloud providers ends the encrypted results back to the data owner. The data owner decrypts the encrypted results to obtain the final out-put.

VMKS (Verified Mutli Keyword Search Encryption): VMKS (Verified Multi-Keyword Search Encryption) is a cryptographic technique that allows users to search for encrypted data without revealing the keywords to the server. This is useful forsecuringsensitivedata,suchasmedicalimages,whichshouldnotbeaccessibleto

Unauthorized parties. To encrypt medical images using VMKS, the following steps are performed:
Create a pair of public and private keys. The digital images are encrypted using the public key, and they are decrypted using the private key. Generate a keyword index. This is a data structure that allows users to search for encrypted images using key-words. Encrypt the images. Each image is encrypted using the public key and the corresponding keyword. Store the encrypted images and the keyword index on the server. To decrypt an image, the user performs the following steps: Query the server for the encrypted image using a keyword. The server returns the encrypted image and the corresponding proof of ownership. The user verifies the proof of ownership using the private key. If the proof of ownership is valid, the user decrypts the image using the private key.

Multiple Data Servers, Cryptosystems: Medical images are highly sensitive data, and their security is of paramount importance. The "Multiple Data Servers, Cryptosystems" technique is a promising approach for encrypting and decrypting medical images in a secure and efficient manner. The technique works by first dividing the medical image into multiple shares. Each share is then encrypted using a different cryptosystem. The encrypted shares are then stored on different data servers to de-crypt the medical image, the user must retrieve all of the encrypted shares from the different data servers and then decrypt them using the corresponding cryptosystems. Once all of the shares have been decrypted, they can be combined to reconstruct the original medical image.
Encryption: The medical image should be divided into several shares. Each share should be encrypted using a distinct cryptosystem. Store the encrypted shares on different data servers.
Decryption: Retrieve all of the encrypted shares from the different data servers. Decrypt each share using the corresponding cryptosystem. Combine the decrypted shares to reconstruct the original medical image.

AES (Advanced Encryption Standard) Block Cipher Algorithm: To encrypt a medical image using AES, the image is first divided into blocks of data. Each block is then encrypted using the AES algorithm. The encrypted blocks are then stored or transmitted. To decrypt an encrypted medical image, the encrypted blocks are first read. Each block is then decrypted using the AES algorithm. The decrypted blocks are then reassembled to form the original image.
Using AES to secure medical images: AES can be applied in a number of ways to secure medical images. AES, for instance, can be utilized to encrypt medical images before they are stored on a computer or transmitted over a network. AES can also be used to encrypt medical images before they are outsourced to a cloud provider. To use AES to secure medical images, it is important to choose a strong key. The key should be at least 128 bits extended, and it should be kept secret. It is also important to use a secure AES's mode of operation. For encrypting medical images, the Cipher Block Chaining (CBC) model is a good option.

AES Encryption: The same key is used for both encryption and decryption when using the symmetric key encryption algorithm known as AES. AES is a popular and highly secure algorithm. In a variety of applications, including data transmission, storage, and protection. AES operates on blocks of data, which are typically 128 bits long. The encryption process consists of 10 rounds, each of which applies a set of transformations to the data block. The transformations include substitution, shifting, mixing, and adding the round key.
AES Decryption: The encryption and decryption processes are comparable, but the transformations are applied in reverse order. The round keys are also applied in re-verse order.

SET (Secure Encryption Transform): The SET (Secure Encryption Transform) technique is an effective, low-weight encryption algorithm that works well with medical images. Its foundation is a permutation and substitution combination. Additionally, it can be applied to hardware or software. To encrypt a medical image using SET, the following steps are performed: The image is divided into blocks of a fixed size. Each block is encrypted using a substitution operation and a permutation operation. The encrypted blocks are then assembled to form the encrypted image. To decrypt a medical image using SET, the following steps are performed: The encrypted image is divided into blocks of the same size as the blocks used for encryption. Each block is decrypted using the reverse of the permutation operation and the substitution operation. The decrypted blocks are then assembled to form the decrypted image.

Adaptive Grasshopper Optimization (AGO): The Adaptive Grasshopper Optimization (AGO) algorithm is based on the swarm behavior of grasshoppers. Grass-hoppers are social insects that communicate with each other using pheromones. In the AGO algorithm, each grasshopper represents a solution to the encryption or decryption problem. The grasshoppers move around the search space in search of the best solution, using pheromones to communicate with each other and learn from each other's experiences. The AGO algorithm can be used to encrypt medical images as follows: The original image is divided into blocks. Each block is encrypted using a different key, which is generated using the AGO algorithm. The encrypted blocks are then assembled to form the encrypted image. The AGO algorithm can also be used to decrypt medical images as follows: The encrypted image is divided into blocks. Each block is decrypted using the same key that was used to encrypt it. The decrypted blocks are then assembled to form the decrypted image. Send the encrypted image to the recipient. To decrypt the medical image, the recipient performs the following steps: Decrypt theencryptedimageusingtheirprivatkey.Thedecryptedimageistheoriginalmedicalimage.

Cryptographic: Medical images can be encrypted and decrypted using crypto-graphic techniques. The process of preventing unauthorized parties from reading in-formation is known as cryptography. Symmetric and The two main categories are asymmetric cryptography techniques. Data is encrypted and decrypted using symmet-riccryptographyusingthesamesecretkey.Unauthorizedpeoplemustbeprevented

From knowing the key in order to prevent them from decrypting the encrypted data. Data is encrypted and decrypted using two separate keys in asymmetric cryptography: a public key and a private key. The private key is used to decrypt data that has been encrypted using the public key. It is necessary to keep the private key secret, but the public key can be distributed to anybody. Using both symmetric and asymmetric cryptography, medical image encryption and decryption is feasible. But while asymmetric cryptography is more secure, symmetric cryptography is typically faster and more effective. Here is a simple example of how to encrypt and decrypt a medical image using symmetric cryptography.

Encryption: Generate a random secret key. Encrypt the medical image using the secret key. This can be done using a variety of cryptographic algorithms, such as AES or DES. Store the encrypted image and the secret key in a secure location.

Decryption: Retrieve the encrypted image and the secret key from the secure location. Decrypt the secret key to decrypt the image. The original medical image is the one that has been decrypted. Asymmetric cryptography can be used to encrypt medical images in a similar way. However, instead of using a single secret key, two different keys are used: both private key and a public key. The publicly available key is used to encrypt the data, and the private key is used to decrypt it. To encrypt a medical image using asymmetric cryptography, the following steps are performed.Create a pair of keys, a public key and a private key. Using the public key, encrypt the medical image.

Table 1. Comparative Analysis of security practices

Sl. No	Practices/Technology	Benefits	Limitations
1	Six-dimensional hyper chaotic map	Good performance, &increased the key size [1].	soft-computing techniques
2	A lossless edge-based map	Machine friendly &robustness [2].	Only suitable for Bruce-force attack.
3	IoMT	High security efficient [5].	Simulation time
4	Homomorphic Encryption	58×improvementin CPU performance [6].	Speedupsof160.9×, 162.9×,80000×,and 12.2×, respectively.
5	VMKS (Verified Mutli keyword search en-cryption)	Low costs for encryption decryption [7].	Limited for multi-owner
6	Multiple data servers, cryptosystems	Lightweight encryption model[8]	Limited data servers
7	AES block cipher algorithm	Combined water-marking-based encry tion[9].	Complex algorithm.
8	SET(Secure Encryption Transform)	Special methods for storage also by using hash algorithm [10].	Only hash is not sufficient we have to combine wi some other model such as AES.
9	Adaptive Grasshopper Optimization	Suitable for multiple attacks	

	(AGO)algorithm	such as exhaustive attack, differential attack, and statistical attack [21].	More distortion
10	Cryptographic	Suitable for real-time encryption and resistance to chosen-plaintext, chosen cipher te and reset attacks[18].	DICOM standard can be used in future.
11	*IoMT, zero-steganography*	*Suitable for multiple attacks such as compression, additive noise, and filtering[22]*	*3Dmedicalimages*

IoMT Zero-Steganography: IoMT zero steganography is a technique for encrypting and decrypting medical images without embedding the cover image. This makes it more difficult for attackers to detect and exploit the hidden data. Here is an overview of the IoMT zero-steganography technique for securing medical images:

Encryption: The medical image is encrypted using a strong encryption algorithm, such as AES or RSA.

Embedding: The encrypted image is embedded in the IoMT system using a zero-steganography technique. This technique does not change the appearance of the image, making it difficult for attacker's to detect.
Transmission: The embedded image is transmitted over the IoMT system.
Decryption: The embedded image is received and decrypted using the same encryption algorithm and zero-steganography technique that were used to encrypt and embed the image.

5 Medical Image Encryption Assessment Measurements

1. PSNR: As an image quality metric: It is expressed in logarithmic decibels. It helps us to compare all the effects of enhancement techniques used in images. The numerical representation of it is as follows:-

$$MSE = \frac{1}{\frac{M}{N}} * \sum_{j=1} \mathrm{I(i,j)} - \mathrm{I'(i,j)}]^2 \quad (1)$$

$$PSNR = 10 * lg(255^2/MSE\ ) \quad (2)$$

Where 'M'&'N' denotes the dimensions*N (Rows*Columns).

2.Mean: It is the average value. Here notes the total number of data used and xi defines the overall sum of it. It is used for removing noise or for filtering.

$$X' = \frac{1}{n} * (\sum xi) \quad (3)$$

3.Variance: It gives us an idea of pixel spread. It is the squares of the standard deviation. Here X means the data values and μ indicates the mean value of the data points.

$$\sigma^2 = \sum X^2/\text{N-}\mu^2 \quad (4)$$

4.Standard Deviation: It means that the intensities of the pixels are near to mean. The values are high for high contrast. It mostly measures the values or mean.

$$\sigma = (x-x')2 \ /\sum f \quad (5)$$

5. Bit error rate (BER): It counts the error per bits. It is measured in percentage.

6. Structural Similarity Index (SSIM): This method is used to take out the difference between similar images. It helps to quantify the image quality which is caused due to transmission of data. Here μ(x) and μ(y) denotes the mean value and o defines the standard deviation value of the dataset. C1 and C2 are constants.

$$SSIM(I, I_W) = (2\mu\mu_w + C_1)(2o(I, I_w + C_2) \quad (6)$$

$$(\mu^2+\mu^2w+C1)(\ o(I)^2+o(I_w)^2+C_2) \quad (7)$$

Conclusion

All-an-all, we have come to know that there is a need for protection of medical data/records or images. The main aim is to avoid the certain modifications made by the third party. Thus, there is an efficient method to overcome these types of problems i.e., encryption model. The reason for choosing image encryption technique is to pro-vide a good quality for images because the scan images are very blurry. While trans-mitting there is a chance adding a noise & more noise ultimate at the receiver side. Hence, we have survey various encrypted methods while considering a speed also. The evaluation can be done by using some mathematical metrics such as PSNR, BER and so on. That helps in estimating the medical image encryption. Thus, this review paper strongly helps the requirements for scientific use & also for improving the accuracy. We can enhance the secure systems by using image document &communication system that allows for the storing of images & completely recover. In this paper we have illustrated a tabular form for the various encryption methods, its technology used, benefits &their limitations. Various methods of security in images are surveyed in this paper. Hence in

this pandemic it helps the users/patients to share the secured medical reports inform of images.

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Fractional Order High Pass Filter Based Extremum Seeking Control for Grid Connected PV System

Laxman Bhukya, Narender Reddy Kedika, Rambabu Motamarri, Surender Reddy Salkuti, and Srinivas Punna

Abstract The solar-based renewable energy became the leading alternate energy injection into the local utility grid to limit the usage of fossil fuels. This power injection must be of high quality and with the maximum possible, hence the utilization of the Maximum Power Point Tracking (MPPT) technique is essential to stabilize and maximize the power supplied by the grid-connected PV source. In this work, an MPPT algorithm called fractional order High-Pass Filter (HPF) based Extremum Seeking Control (ESC) for grid-connected solar photovoltaic (PV) systems is proposed. The DC link voltage and the power injected into the grid are regulated with voltage source inverter (VSI) control using d-q components of the grid currents. The proposed is a benchmarked algorithm against conventional Perturb & Observe (P&O), Integer Order extremum seeking control (IOESC) methods. The efficiency of the proposed method is illustrated using MATLAB simulations under uniform and variable irradiances. Utilizing the Fractional order operators in an ESC scheme enhances the robustness, convergence speed, efficiency, and performance of the solar PV system.

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EV BMS With Charge Monitor and Fire Detection

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Abstract. Electric vehicles (EVs) are undoubtedly the way of the future. However, as of 2023, EV technology has not reached its full potential in terms of efficiency and safety. The cause of majority of the electric vehicle fire events is a battery explosion or fire. This paper presents an integrated approach to manage EV battery systems, which combines a Battery Management System (BMS) with charge monitoring and fire detection. The system is built to continuously monitor the battery's voltage, current, and temperature and to immediately turn off the battery's input or output if any unexpected behaviour is noticed.

Keywords: *EVs, BMS, Temperature Sensor*

1 Introduction

The adoption of electric vehicles (EVs) has been steadily increasing in recent past, driven by a combination of factors viz. environmental concerns, fuel efficiency, and government incentives. However, managing the battery systems that power EVs is a serious challenge that must be addressed to ensure the safety and efficiency of these vehicles. The battery system in an EV consists of several battery cells, which need to be monitored and regulated to prevent overcharging or discharging, which can lead to reduced battery The BMS consists of battery cells, a battery life, reduced performance, and even safety hazards such as fires.

Battery Management Unit (BMU), and sensors, which work together to monitor and regulate theVoltage sensors are used to monitor voltage and control the amount of current that can go to the battery while it is charging. Charging circuitry is utilised to do this. Battery voltage is displayed on the LCD. The current sensor monitors current drawn from the battery when it is connected to a load and shows the parameter on LCD. The temperature sensor is used to keep track of the battery's temperature both while charging and discharging. The system automatically sounds a buzzer alarm and displays a message on the LCD if the battery temperature is seen to differ from the expected values. As a result, the technology enables an intelligent and effective battery charging and detecting system.

Battery's state of health, state of charge, and temperature. The charge monitoring system provides real-time feedback on the charging process, including the amount of power being

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Novel Intelligence ANFIS Technique for Two-Area Hybrid Power System's Load Frequency Regulation

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Abstract. The main objective of Load Frequency Control (LFC) is to effectively manage the power output of an electric generator at a designated site, in order to maintain system frequency and tie-line loading within desired limits, in reaction to fluctuations. The adaptive neuro-fuzzy inference system (ANFIS) is a controller that integrates the beneficial features of neural networks and fuzzy networks. The comparative analysis of Artificial Neural Network (ANN), Adaptive Neuro-Fuzzy Inference System (ANFIS), and Proportional-Integral-Derivative (PID)-based methodologies demonstrates that the suggested ANFIS controller outperforms both the PID controller and the ANN controller in mitigating power and frequency deviations across many regions of a hybrid power system. Two systems are analysed and represented using mathematical models. The initial system comprises a thermal plant alongside photovoltaic (PV) grid-connected installations equipped with maximum power point trackers (MPPT). The second system comprises hydroelectric systems. The MATLAB/Simulink software is employed to conduct a comparative analysis of the outcomes produced by the controllers.

Keywords: AGC, ANFIS, LFC, MPPT, PV system, PID

1. Introduction

Now days, electricity is crucial because more and more individuals require it. Changes in the system's operating point and disturbances influence the system's dynamic behaviour. In power plants, the quality of the electricity generated is contingent on the machine's capacity[1]. The rate and intensity of the electricity must remain constant, as intended. Therefore, load frequency control is a crucial component of the power system if it

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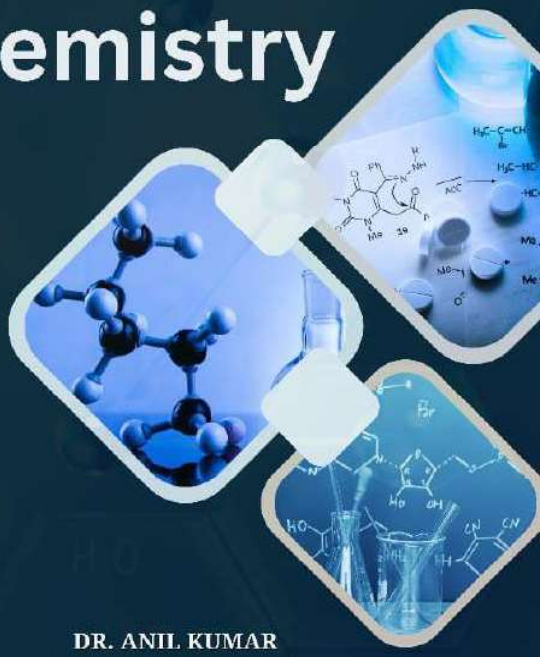

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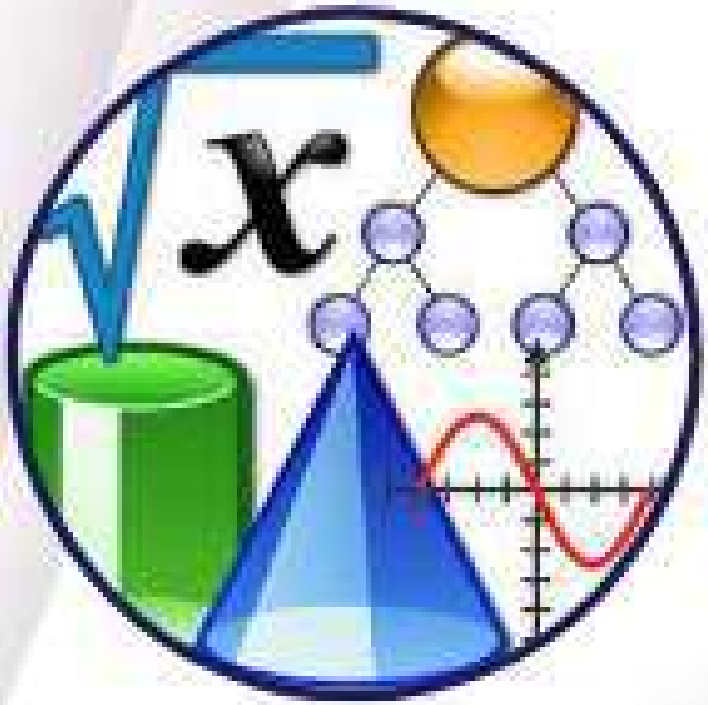

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GRAMMAR-A SENTENCE MAKING MACHINE

Abstract

This research article is based on the teaching experience of the Author in academic, professional and competitive exams' English language teaching. It is the outcome of his observations and informal interviews with the learners and teachers.

Grammar is a Sentence making machine, an invisible force that drives the language user forward **accurately**, **meaningfully** and **appropriately** (Larsen-Freeman 2003).This research article encapsulates these areas and ideas of Grammar teaching and learning from the perspective of research and developments of the young learners of this webworm generation. The productive skills of Writing and Speaking depend on the receptive skills of Listening and Reading. Which means, the input is receptive skills and the output is productive skills? Recall the Context, Retain the Text and Reproduce it in the Test is the formula. Contextually/ Situationally, the learners should be encouraged to recollect or remember the Form, Meaning and Use of the Structure of sentence construction. Spelling, Sound, Subject Verb Agreement and Meaning. Eclectic approach (Brown, 2002) which is the blend of teaching in English and switching to mother tongue in between when the situation demands is one of the approaches discussed in this article. Under Lexical approach (Michael Lewis, 1993) Learner participation, Keen observation and Negative evidence are discussed with special reference to the younger generation's English language needs and mindsets. Common errors in the usage of Grammar and solutions are spelled out. Multipurpose English Table emphasized in this article is the crux of spoken and written communication needs of the English language practitioner's and learners alike in terms of accuracy, meaning and appropriacy of Grammar usage. This paper also showcases the multiple intelligences theory proposed by Howard Gardner, 1983. ILI (Individualized/ Customized learning instruction) depending on

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the learning styles of the learners brings this research article to summation.

Keywords: Internalisation/ Automatisation, VGP(Vocabulary, Grammar, Pronunciation/ Punctuation), Lexical approach, Eclectic approach, Multiple Intelligences theory. Recall the Context, Retain the Text and Reproduce it in the test. Form, Meaning Use (FMU) and ILI (Individualized Learning Instruction).

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I. DISCUSSION

Grammar is a Sentence making machine, an invisible force that drives the language user forward **accurately**, **meaningfully** and **appropriately.** (Larsen-Freeman 2003) Let us discuss these three areas of Grammar teaching and Learning from the perspective of research and developments of the young learners of this web worm generation. To begin with, the productive skills of Writing and Speaking depend on the receptive skills of Listening and Reading. Which means, the input is receptive skills and the output is productive skills? Recall the Context, Retain the Text and Reproduce it in the Test is the formula. Contextually/Situationally, the learners should be encouraged to recollect or remember the Form, Meaning and Use of the Structure of sentence construction. Spelling, Sound, Subject Verb Agreement and Meaning.

1. **Use it or Lose it:** The Language users should Use English on Social media platforms as much as they can. This is the platform where they spend half of their lifetime!!! They should be encouraged to use English language exclusively to develop the knowledge of sentence construction, spelling, phrases and expressions, confidence, command, authority, fluency and accuracy. The problem with the young English learners now-a- days is that they use English script to communicate in their local language. We say Communication skills are extremely important but we never communicate in English. In the light of this situation, how can we develop confident written and spoken communication? One of the solutions is Use English on Social Media platforms.

2. **Appropriateness:** Using the relevant Grammar structures depending on the context and text has to be properly practised. Actually, subconsciously, the structuring of sentences can be executed while speaking and writing when the confidence levels of the user are properly enhanced. Let me use the term Strategy here in terms of grammatical careful plan or method. Grammatical strategy is an attentive internally changeable intellectual technique aimed at refining the constructiveness or remedying for the breakdowns in the making of particular writing and reading or listening and speaking of the texts and contexts/situations.

   Oxford Advanced Learner's Dictionary defines "Grammar" as the rules in a language for changing the form of words and joining them into sentences. Conventionally it is the Subject Verb agreement of sentences. A competent listener /reader /speaker /writer of the language apply these rules to listen /read /speak /write effectively and acceptably.

3. **The Problems Encountered by the Young Learners**

- Common mistakes in everyday English.
- Use of substandard phrases and expressions.
- Not meticulous about practicing simple but correct English which is logically, grammatically and meaningfully correct.
- Very poor reading habits whether it is screen reading or hard copy reading
- Less priority to acquire/learn English as a medium of communication
- Poor encouraging environment
- The feeling of mother tongue and other tongue bias
- Regular users who are so called professionals' language which is substandard

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- Shortage of suitable mentors to guide with resourceful tips and techniques
- Less Role models whom the young learners can emulate
- **Did followed by v2:** He did not came yesterday.(**Correct**: did not come yesterday)
- **Last Before Year, the Concerned Author:** (**Correct**: Year before last, the author concerned)
- Today college is there, no it is not there. No is there. (**Correct one**: Is it a working day today? Are we working today? For Business establishments: We are open today or we are closed today)
- **We doesn't, They doesn't:** (**Correct ones**: We don't, They don't)
- **Cope Up:** (**Correct:** Cope meaning Manage, Cope with (Not cope up)
- **Most Unique:** (**Correct**: unique)
- **One Another, Each Other:** Each other for 2 persons and One another for more than 2 persons
- **Between, Among:** The Trio kept the secret among them. (2 persons between, more than 2 persons among)
- **Past Perfect Tense:** A past in the past
- **Present Perfect Tense:** Just now, so far, not yet, already, recently, of late (Important Time phrases used)
- **Future Perfect Tense**: will have been
- Wrong usage of present continuous: I am having 4 brothers and 3 sisters. (**Correct**: I have 4 brothers and 3 sisters.)
- Wrong usage of passive. The worksheets have corrected. The data sheets have gathered. (**Correct:** The worksheets have been corrected. The data sheets have been gathered.)

4. Solutions to the Research Problems

- **Common Errors in Everyday English**: All future generations have to practice using English in their day-to-day life. Several discussions have taken place and research has been done in this regard. However, the amount and volume of English that the young users use in day-to-day life is considerably negligible. They are tempted to use their local language especially in canteen, bus, campus and even Buddy Teaching. As proposed by Michael Lewis (1993) in his Lexical Approach the teachers will have to discuss the language patterns, phrases and expressions with the learners as a roughly tuned input during the informal conversations with them. This will be captivating their interest to develop language skills as the teacher himself stands as a role model.

  The chunks will be entrenched in their long-term memory. They can pluck the chunks out during the times of exams, interviews and viva voce examinations. They can also use them in their workplace in their future.

- **Buddy Teaching**: Let the students explain the subject in English to his buddy who was absent the previous day. This has been proven in the case of one my colleagues who did this to his buddies explaining the core engineering concepts to his peers in English which enabled him to develop his confidence levels of the subject in particular and language skills in general.

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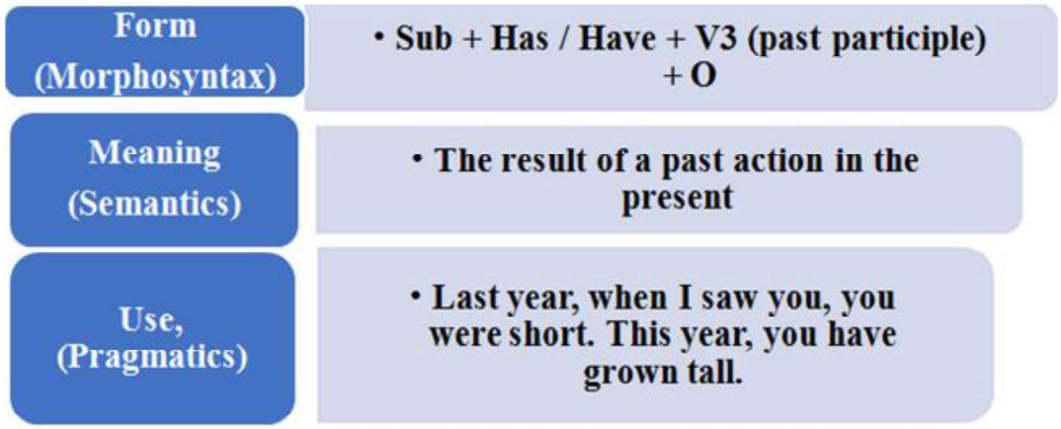
- **Use of Standard Phrases and Expressions**: Substandard phrases and expressions have become part and parcel of this younger generation's spoken and written English. Examples are: You only told me no, (Correct one: It was you who told me) Bunking the classes (Skipping the classes is better) the biometric is coming or not coming (The biometric is working or not working?) The current gone. The current came. (The power went off or the power resumed) This kind of simple phrases and expressions have to be properly understood, learnt, remembered, recalled and reproduced based on the context.

- **Very Poor Reading Habits Whether it is Screen Reading or Hard Copy Reading:** Students especially the first year engineering students read unless it is unavoidable and mandatory in terms of writing exams or attending viva voce exams. This habit should be broken. In order to support themselves mentally, physically, emotionally, intellectually and in a team the young blood should keep reading, and a constant and consistent practise of reading will be converted into a habit and life style. ***Reading relaxes the body and cools the mind. Reading helps the young learners to think in a logical and clear manner. Readers are Leaders. Think before you speak and read before you think.***

II. FORM, MEANING AND USE



Practice the Form, Meaning and Use especially by using Referencing tools such as Dictionaries and Thesauruses. Cambridge Online Dictionary is one such excellent referencing tool that young students should make use of as it not only enables the learners to learn correct phonetic transcription, pronunciation, stress markers but also the correct meaning and usage. E-Thesaurus is another tempting take away tool that the students should download on their smartphones as a ready reckoner for their language needs. For instance, the word Mayhem: Turmoil, Commotion, Disturbance, Disorder, Unrest. A string of synonyms or antonyms can be explored on thesaurus. The more the merrier. This will empower the students to develop their knowledge of vocabulary and develop confidence in terms of spoken and written communication. And one must practice the art of writing with ***patience and great care***.

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- Paraphrasing is an art. All the Scholars and researchers are bombarded by the knowledge explosion, and they are tempted to copy.
- The best way to make the ideas one's own by writing them in one's own language is a great challenge that challenges all the intellectuals.
- Most importantly in terms of passive structures, tenses, syntax, collocations, phrases and expressions.
- How do we best summarize the text in terms of paraphrasing without losing the actual meaning of it??? A million-dollar question???
- Syntax, Subject Verb Agreement or Concord (We don't, they doesn't (Correct ones: We don't and They don't) Even Professionals commit this mistake in their pep talks and conversations. Of course, in written communication too. This should be properly learnt.
- The sequence of 1st, 2nd and 3rd persons (For a positive idea: You, He and I will be rewarded for the exemplary work that we have done. For a negative idea: I, You and He will be penalized for the blunder that we have committed>)
- Which sentence? Simple, Complex or Compound
- Tricky Confusion with prepositions: Especially I came to college by walk (Correct one: On foot, My classroom is in the 2nd floor (Correct one: On the second floor)
- Conjunction connection should be meticulously practised
- The correct collocation: The co-occurrence of parts of speech (Big fat salary, handsome salary, Hearty Congratulations and Deepest Condolences) should be appropriately remembered, retained and reproduced.

Take Care of these Following Progression Markers/Connecting/Link/Sign Posts or in Short Conjunctions:

Conjunction Connection

S.No	Conjunctions		
1.	Hardly	**Followed by**	When
2.	Scarcely		When
3.	Lest		Should
4.	Else		Would
5.	Although		Yet
6.	Both		And
7.	Between		And
8.	Not only		But also
9.	No sooner		Than

1. **Practice Makes Perfect:** Access to and **practicing** sufficient amount of "**samples"** result in successful Automatization. Repetition which is one of the oldest keys of teaching and learning will yield fruitful results by accessing and practicing different models, structures of Grammar. The research confirms that acquisition of learning doesn't take place unless the learner revises and revisits the structures, phrases and expressions repeatedly. The research also showcases that when a learner learns a structure, phrase or expression for seven times it gets entrenched in his long-term

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memory. When the situation demands he can pluck out the structure, phrase or expression and use it according to the situation.

2. **Eclectic Approach (Brown, 2002)** A conscious blending of different methods. Need based. Integration of implicit/explicit prescriptive/descriptive teaching through reinforcement. Teachers should practice this approach. Teachers should think about this Eclectic Approach in terms of consciously and carefully using mother tongue in the process of teaching and learning without affecting the learning enthusiasm of the learner in the target language. When the situation demands the vernacular language alternatives may be provided to the young learners to enable their process of learning interesting, thought provoking, brain- storming and innovative/creative.

- Lexical Approach and the Eclectic Approach would enrich the understanding of the language system, its patterns and its use in a fruitful/productive and result-oriented manner.
- This approach of teaching empowers to produce correct language and transforms the learners into self-monitoring, self-directing and self-guiding individuals. (Independent language learners) Metacognition is appropriately learnt here.
- Builds the confidence levels as the learners self-correct and eliminate the wrong sentence structures and phrases
- Results in fine-tuning the performance outcome
- **Implicit Grammar Teaching:** focuses on meaning rather than form. It is contextualized and authentic language not rules or forms.
- **Explicit Grammar Teaching:** language forms and explains the grammar rules and practice through drilling. Best Activities: Spot errors/Gap filling
- Swift and effortless listening, speaking, reading and writing is Automatization
- Automatization demands practice and real mastery
- Internalizing structural knowledge will be on an unconscious level resulting in functional usage
- One must study the best models and learn from them

Lexical Approach (Michael Lewis, 1993)

3. **Learner participation:** Increase the Talking time of the Learners especially in the classrooms, Language laboratories so that the classroom becomes a learning hub. Let the students open up, think, react, respond elaborately.

4. **Keen observation:** Stephen Krashen (1989) mentions that language acquisition takes place subconsciously when the learners are exposed to language. However, conscious and keen observation during the process of language learning would result in confidence building in terms of spoken and written communication. Vocabulary, Grammar and Punctuation for Writing and Vocabulary, Grammar and Pronunciation for speaking.

VGPP is the Foundation on which the Listening, Speaking, Reading and Writing floors can be built. The Learners should be exposed to quality inputs in terms of Man, Method and Materials or Teacher, Technique and Text so that the quality inputs are converted into quality intakes.

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5. **Negative Evidence**: Eventually, before this discussion is brought to an end, let me quote an anecdote in terms of over generalization of negative evidences/assumptions which impact real life situations. One of the Professors who are not from the English faculty background was speaking in the Retirement meeting of another Professor. The Professor who was speaking was using the combination **notorious** as negative evidence. He was saying Prof. Verma was notorious in conducting several workshops and welfare programmes. He was notorious in bringing Wi-Fi facility to the scholars' hostels. Likewise, the professor who was speaking used the word notorious several times in his talk.

   One of the English Professors seated in the audience who could not contain his enthusiasm went ahead and asked the one who spoke by using the word notorious several times in his talk in terms of what is that he understands about notorious. The Professor said popular and famous. Then the English Professor explained him that it is truly popular and famous but famous for negative things such as a notorious killer/criminal/smuggler etc., this is a blazing example of over generalization/assumption of intangible combinations. The Teachers and Experts should ensure that this kind of negative evidence doesn't occur in the language learning process of the young English language learners.

III. CONTRADICTORY VIEWS

1. **Implicit Grammar Teaching vs Explicit Grammar Teaching:** Explicit is rule based and it is from rule to example. Implicit is from example to rule. There has been a discussion and contradiction between rule-based teaching and context-based teaching. Communicative Language Teaching emphasizes on Implicit Grammar Teaching rather than Explicit that a Learner should learn based on the context rather than hard core rules. Lexical Approach is an extension of Communicative Language Teaching. Eclectic Approach is a perfect blend of both the implicit and explicit methods depending on the situation, level of the learner in terms of Multiple Intelligences proposed by Howard Gardner (1983). Individualized/Customized/Tailor made Grammar Teaching needs to be adopted by the Grammar practitioners and Teachers. The Multipurpose English Table introduced in this discussion emphasizes learning Grammar through both the methods i.e., Implicit and Explicit. It not only helps the learner practice the rigorous writing/speaking generating drill, but also enables the learners with special reference to understanding different grammar structures related to various tenses.

2. **Grammaticalized Lexis or Lexicalized Grammar?** Lexical Approach proposes that it should be Grammaticalized Lexis not Lexicalized Grammar. Grammaticalized Lexis meaning more importance is provided to words by taking the support of Grammar. Lexicalized Grammar is Grammar structures are prioritized by inserting words into those structures. This discussion emphasizes both the Grammaticalized Lexis and the Lexicalized Grammar depending on the learning style of the learner.

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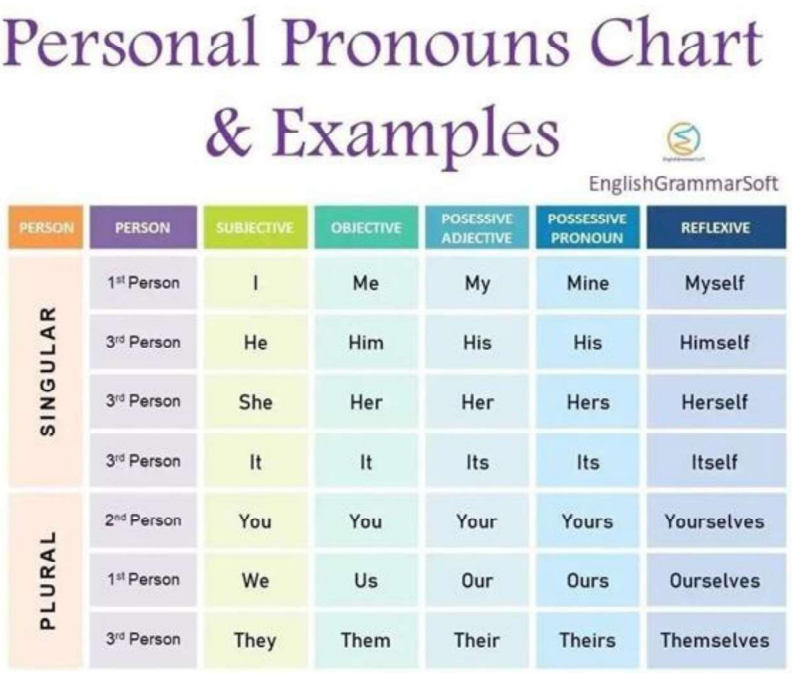
3. **Multipurpose English Table**: Practice Multipurpose English Table



4. **Practice:** Rigorous writing generating drill such as using Active voice, Passive voice, all the tenses, positive, negative, positive interrogative and negative interrogative sentences need to be practiced. All the Personal pronouns can be used here. For example I, You, We, They etc.,

Sentences	**Active voice/Simple present**	**Passive Voice/Simple present**	**Active Voice/Present Perfect**	**Passive Voice/Present perfect**
Positive	Sachin plays cricket everyday.	Cricket is played by Sachin everyday.	Sachin has played Cricket so far.	Cricket has been played by Sachin so far.
Negative	Sachin doesn't play cricket everyday.	Cricket is not played by Sachin every day.	Sachin has not played Cricket so far.	Cricket has not been played by Sachin so far.
Positive Interrogative	Doesn't Sachin play cricket every day?	Isn't Cricket played by Sachin every day?	Hasn't Sachin played Cricket so far?	Hasn't Cricket been played by Sachin so far?
Negative Interrogative	Does Sachin play cricket every day?	Is Cricket played by Sachin every day?	Has Sachin played Cricket so far?	Has Cricket been played by Sachin so far?

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5. **Howard Gardner (1983) has Suggested the Multiple Intelligences Theory.**

- Visual-spatial
- Linguistic-verbal
- Logical-mathematical
- Body-kinaesthetic
- Musical
- Interpersonal
- Intrapersonal
- Naturalistic

Teachers and Parents should identify which learning style does their child prefer and why. Students should recognize which learning style in the given styles they are comfortable with.

6. **Individualized Learning Instruction**: (Customized/Tailor made) should be provided to the young and enthusiastic learners of English to sustain their interest levels and to transform them into successful and confident language users.

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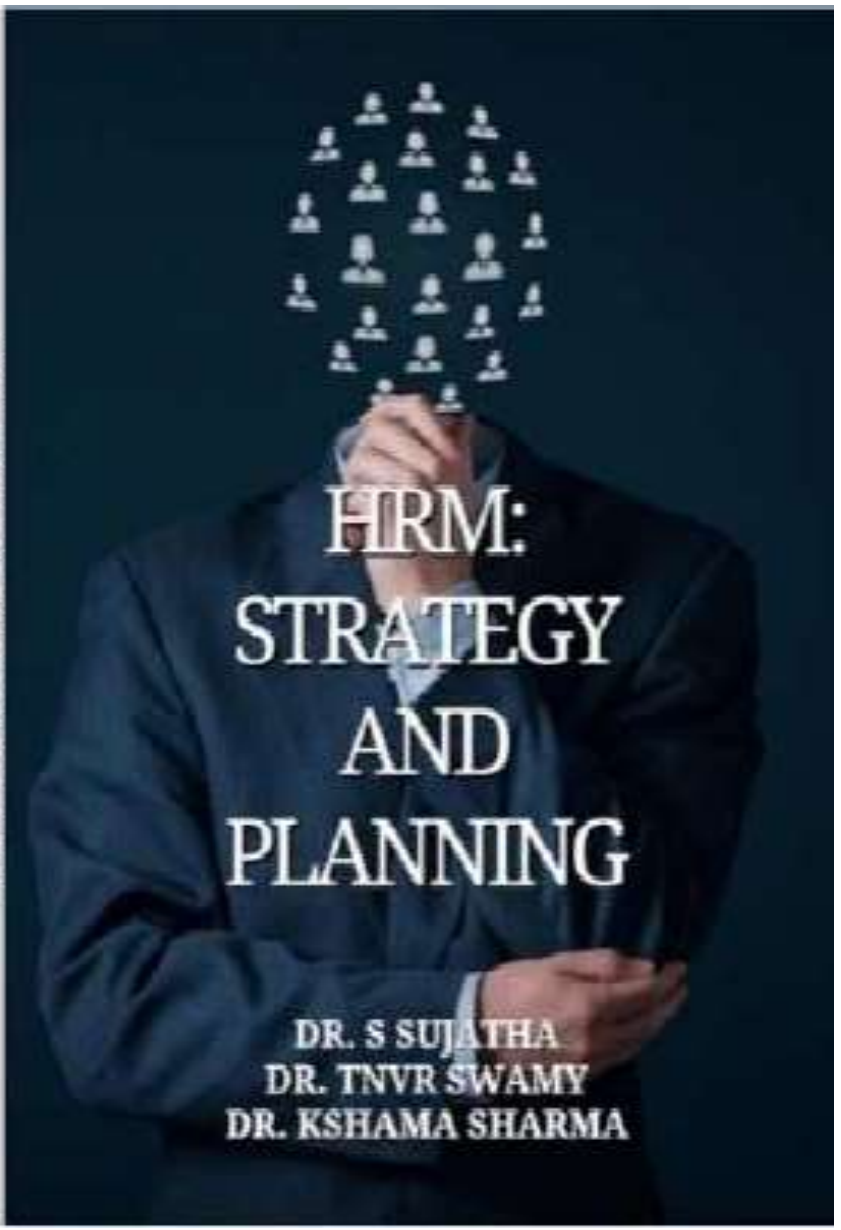

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For presenting the research paper entitled "Prediction of Flow Resistance in Overbank Flows Using Support Vector Machine " in the Second International Conference on Advancements in Sustainable Materials and Infrastructure - 2023 (ASMI - 2023) held online on 12-13, September 2023. The conference has been jointly organized by Sreenidhi Institute of Science and Technology (SNIST), Hyderabad and K.S.R.M. College of Engineering (K.S.R.M.CE), Kadapa.

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