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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

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S. 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	Abeena A	Investigation of Dynamic Eccentricity in Interior Permanent Magnet Synchronous Motor through finite element method and machine learning	Investigation of Dynamic Eccentricity in Interior Permanent Magnet Synchronous Motor through finite element method and machine learning	CISCON 2024	CISCON 2024	International	2024	979-8-3503-7548-0	Nehru College of Engineering and Research Centre	IEEE
2	Ms. Neethu M	Lecture Notes in Electrical Engineering	BT Classification Using Deep Learning Techniques from MRI	Lecture Notes in Electrical Engineering	Futuristic Communication and Network Technologies	International	2023	ISSN 1876-1119 ISBN 978-981-19-8337-5	VIT	Springer

			Images-A Review							
3	P.Rajkumar		6G Optical and Wireless Communication Network for IoT Applications	KETCON 2024 Proceedings	Ketkon APJAKT U Techfest and Ketcon Ahalia Conference	National	Feb-24		NCERC, PAMPAD Y	
4	Dr. Mredhula L		6G Optical and Wireless Communication Network for IoT Applications	KETCON 2024 Proceedings	Ketkon APJAKT U Techfest and Ketcon Ahalia Conference	National	Feb-24		NCERC, PAMPAD Y	
5	Ms.Anooja B		Advanced Biosensors for various virus detection	KETCON 2024 Proceedings	Ketkon APJAKT U Techfest and Ketcon Ahalia	National	Feb-24		NCERC, PAMPAD Y	

					Conferenc e					
6	SAJITHA A S	DIGITAL ELECTRONI CS					Jul-23	ISBN- 978-81- 19313- 36-5	NCERC	Global AASAN Research Publication
7	SAJITHA A S			Fractal- Enhanced Micro-strip Antennas: Miniaturization, Multiband Perf ormance and Cross- Polarization Minimization for Wi-Fi Applications			Oct-23		NCERC	
8	Dhanya Nair	-	-	A study of work-life balance in banking sector and its relation with job performance with reference to Palakkad(dt)	Thriving In Turbulent Times: Sustainabl e Growth Through Innovative Practices	Internatio nal	2023	ISBN: 978-81- 963865 -4-2	Nehru College of Engineerin g and Research Centre, Pampady, Thiruvillwa mala, Kerala	Quing Publisher

9	Prof.Dr.Krishna Kumar TP		IoT Alert Reflexion of Forbidden Deforestation Regions with Drone observation	2023 Third International Conference on Artificial Intelligence and Smart Energy (ICAIS)	2023 Third International Conference on Artificial Intelligence and Smart Energy (ICAIS)	International	2023	ISSN 1803–7232)	Nehru College of Engineering and Research Centre, Pampady, Thiruvillwamala, Kerala	IEEE
10	Dr R Suriakala	Financial Markets and Institutions					2023	ISBN:978-93-5762-079-6	Nehru College of Engineering and Research Centre, Pampady, Thiruvillwamala, Kerala	Alpha International Publication (AIP)

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**21st Control Instrumentation Systems Conference
(CISCON-2024)**

August 2-3, 2024



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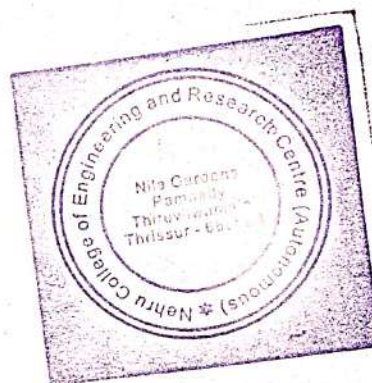
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Lecture Notes in Electrical Engineering 966

N. Subhashini
Morris, A. G. Ezra
Shien-Kuei Liaw *Editors*

Futuristic Communication and Network Technologies

Select Proceedings of VICFCNT 2021,
Volume 1

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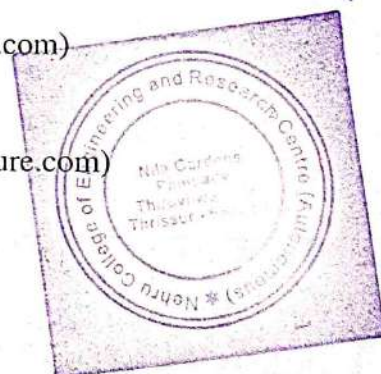
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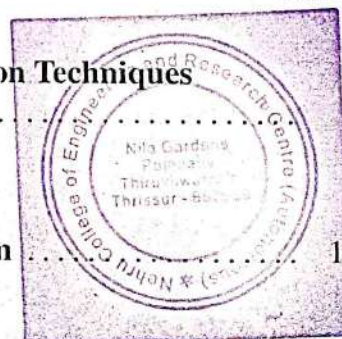
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About This Book

Every year, communication technologies break through new limits, and the rate of development is no secret. There is a lot of room for improvement, which allows us to discuss the newest developments and forecast future trends. This book aims at offering new ideas and an in-depth information on the research findings in the field of communication and networks and contains the original research work presented at the Virtual International Conference on Futuristic Communication and Network Technologies (VICFCNT 2021) held on 10–11 December 2021 in Vellore Institute of Technology, Chennai. Problems, challenges, prospects, and research findings in communication and network technologies are the primary topics of discussion. The book is published in two volumes and covers cutting-edge research in cyber-physical systems, optical communication and networks, signal processing, wireless communication, antennas, microwave engineering, RF technologies, Internet of things, MEMS, NEMS, wearable technologies, as well as other contemporary technological advances. This book presents state-of-the-art innovations in the field of communication and offers promising solutions to many real-world problems. It will be a valuable resource for individuals to expand their knowledge and enhance their research ideas, as well as channelling them in the ideal direction for future research in these areas.

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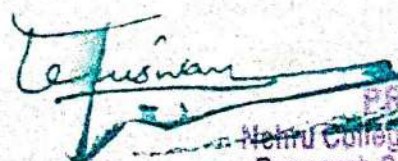


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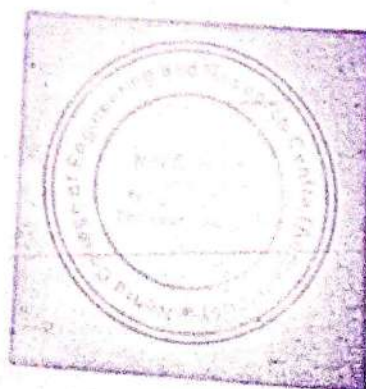
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BT Classification Using Deep Learning Techniques from MRI Images—A Review



M. Neethu and J. Roopa Jayasingh

Abstract Cancers are the vast reported diseases leading to death, all over the world in last decade. Brain tumours have a major role among them. The analysis of malignance can be done only through biopsy test now, which is to be performed after a surgery. There are many researches under progress to find the malignance of tissues, by studying the scanned images. Artificial Intelligence is a very useful tool to perform analysis of databases. The new methods must allow the specialist to do the tumour detection more easily, and this paper studies about various researches already progressed in this area and suggests the most appropriate methods for each stage of image classification.

Keywords Brain tumour · Artificial intelligence · Biomedical image processing · Accuracy

1 Introduction

Irrespective to the rate of developments in the fields of medicine and technology, the number of new cases identified with different cancer diseases is increasing every day. This is considered as a significant problem to be addressed seriously for the well-being of entire humankind itself. Among all the cancers, brain tumour is playing a vigorous role. In the USA alone, about 23,000 fresh cases were reported in the year 2015 [1]. This number gradually increased in the following years is reached to approximately 80,000 fresh cases in 2018. A painful fact is that both children and adults are equally affected. There are different types of brain tumours. Different types and their share can be summarised as: Meningioma—36.3%, Gliomas—26.5%, Pituitary tumours—16.2% and other types together (Medulloblastoma, Lymphomas, etc.)—21%. It is nevertheless to say that the timely identification and accurate detection are very important in the treatment. The three important things which decide the possibility of curing are the degree of tumour, the pathological type and category in

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which tumour belongs. The brain contains tissues and nerve cells to regulate each and every action of whole body, and it is the most complicated part in human body itself. Every cell has its own capabilities and functions. Cells develop and normally function ordinarily. Some cells show reduction in their proficiencies by stopping the growth and then become atypical. When the number of such abnormal cells increases, they form a tissue and we call it as tumour. Such irregularly propagating tissues formed by a bulk group of atypical cells in the brain are called as brain tumours [2–4].

For the treatment for the prevention of further spread and cure of cancer diseases, an accurate identification of stage and kind of tumour is required. Magnetic resonance imaging (MRI) is used all over the world by radiologists for this purpose [5]. The physical features such as shape, size and position of organs or tissues can be obtained by magnetic resonance imaging technique, without application of high intensity ionising energy [6]. These images are rich enough to study and generally precise, depending on the efficiency of equipment. Most important advantage of MRI imaging technology is that it provides accurate guidance for locating the surgical treatment and avoiding the thoracotomy or laparotomy procedures for diagnostic purposes. Brain tumour MRI is using three-dimensional multiband imaging technologies, which helps the medical practitioner to locate the lesion area accurately. The 3D technology can provide exact coordinate position when compared to old 2D technology. The 3D brain imaging provides the anatomy in three planes, namely sagittal, axial and coronal. Moreover, the brain MRI technology also provides diverse structures of one tissue, by applying different development sequences, known as a multimodal MRI output. There are four modes or sequences in brain MRI imaging, based on the Repetition Time (RT) and Time to Echo (TE) auxiliary conditions selected while imaging, namely T1 weighted, T2CE mode, T2 weighted and Fluid-Attenuated Inversion Recovery (FLAIR) mode. The different sequences are aiding to investigate different features of same tumour [7]. Application of machine learning techniques are for the faster analysis and accurate detection of information from MRI images [5].

The brain tumour segmentation methods existing now, automatic as well as semi-automatic methods, can be categorised broadly as techniques based on generative model based and techniques based on discriminative model [8]. The statistics gained via probabilistic image atlases are essential for generative model-based segmentation techniques. Based on this prior information, the brain tumour segmentation is modelled as an outlier detection problem. Unlike generative models, in discriminative model-based techniques, the problem is solved by pattern classification setting. In other words, classify the image voxels of tissues as normal or abnormal, based on features of MRI images. Obviously, the performance of later models greatly depends on the algorithms using for the feature extraction and classification of MRI outputs. The image features adopted for brain tumour segmentation studies are various, e.g. local histograms, image textures, structure tensor eigen values, etc. For the pattern classification, among different available algorithms, most popular is Support Vector Machines (SVMs) [9] and Random Forests [10]. Image classification [11], object detection [12] and semantic segmentation [13] are done with an improved accuracy by adopting deep learning techniques in recent studies. There are several methods based on deep learning techniques, which are using for image segmentation. Among them

Convolutional Neural Network (CNN)-based methods were shown better performance than other methods. The three-dimensional CNN models were also tried in some studies for the segmentation of BT MRI outputs.

2 Literature Review

Mr. Sunil Mahajan et al. in their research used the Softmax loss function, a deep learning technique, for classification in the brain tumour detection from 3D MRI images. This method has reduced the risk of overfitting than earlier studies. At the same time, it failed to evaluate the detection method for a large database, which is the most important factor on accuracy of results [14].

Ahmet Cinar and Muhammed Yildirim together developed a hybrid model, which is a modification based on Resnet50 architecture, for the classification of images. Resnet50 is a hybrid CNN model which belongs to deep learning technique. Softmax loss function is also used in this before the final classification. This eight-layer method had high accuracy rate. The drawback of this classification technique is high computational complexity [15].

Gawad et al., had done the brain tumour detection from MRI outputs using an optimised edge detection technique. Balance Contrast Enhancement Technique (BCET) is used for improving the features of medical images, and then, the edge detection is achieved through Genetic Algorithms (GAs). In this research, the method improved image features well to deliver improved image characteristics. But, much more iterations are required to obtain a better classification result [16].

Li et al., have developed the multi-CNN, a combination of multimodal informal fusion with Convolutional Neural Network, for improving the accuracy of brain tumour detection from 3D images. This method had shown good localisation and provided detection of sharper edges effectively. Currently, this is tested with a small dataset only and has to be tested for larger datasets that include different ages and races to ensure its probability and failed to extend it in other medical applications too [7].

Noreen et al., had tried another deep learning model, which is based on the concatenation approach. The research includes two models: DenseNet201 and Inception-v3, with Softmax as classifier. These methods had shown good performance in tumour detection. When iterated with large number of layers on the pre-trained models, his method was failed in applying fine tune techniques [2].

Saba et al., had tried with one method for segmentation and another one for fine turning, the GrabCut method and VGG 19 Transfer Learning model, respectively. This method also had shown good performance in terms of tumour detection. The drawback of the method is its high running time [17].

Hazhemzehi et al., tried to develop a hybrid model by using the Neural Autoregressive Distribution Estimation (NADE) technique with CNN. Unlike other researches, this method for image classification had not only smoothened the boundaries of MRI images and removed the unsought features, but also extracted the advantageous

features required. The massive computational complexity is the major setback of this method [5].

Zhao et al., had developed a deep learning model by combining Conditional Random Fields (CRFs) with Fully Convolutional Neural Network (F-CNN). Even though the method has failed to get rid of the problem of imbalances in training data, it has shown good computational efficiency [18].

3 Challenges

The challenges addressed in different brain tumour detection studies may be summarised as below.

The 2D F-CNNs and CRF-RNN method is developed for brain tumour segmentation. Image slices are utilised as the training data. Training is done using CRF-RNN and fine tuning is done by using an integrated model of CRF-RNN with F-CNN. The segmentation performance of this network may be degraded as the number of images' pixels for different classes is different in slices [18].

In [16], the major drawback of the method is low accuracy of detection, which mostly depends on the images selected for training. In this proposal, the time for training is considered for the training of samples, as a function of count of images used. In order to achieve an improved accuracy-speed trade-off, the count of images using to train may be varied.

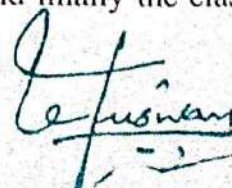
The challenge in the concatenation approach lies in two venues. In the application of the techniques for fine tuning, the pre-trained models may be trained with a greater number of layers. And, for the classification purpose, data augmentation techniques may be applied with scratch-based models [2].

The deep learning method improved the accuracy in detection and classification of not only brain tumours but also other types of tumours along with it. Moreover, this method decreased the time for computation and increased the accuracy. The challenge lies in implementing the detection method for large datasets [14].

It is nevertheless to say that it is a challenge to detect the edges of any MRI outputs accurately. Regarding precise diagnosis of disease, the accuracy in detection is critical and important. The inaccuracy in availed data is the most identified constraint in the analysis of MRI outputs.

4 Proposed Methodology

This research primarily focussed to design and develop a novel method for the detection of brain tumours from MRI images. An optimisation algorithm for this purpose will be major contribution committed by research. In bird's-eye view, there are five stages of iterations included in the procedure, namely region of interest (RoI) extraction, preprocessing, segmentation, feature extraction and finally the classification.



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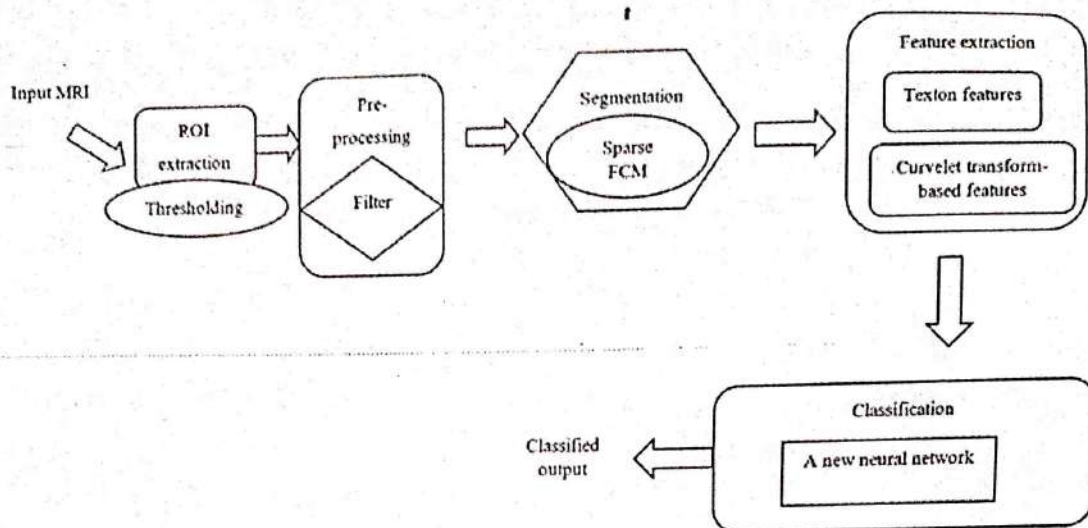


Fig. 1 Block diagram of the proposed brain tumour detection process

The thresholding-based ROI extraction module will be the primary one which is intended to give the regions in the image for further stages of study. In order to remove the noise in these extracted features, a preprocessing module is designed. The T2F15 filter is preferred in this module. The Fuzzy C-Means (FCM) clustering algorithm will be used for the segmentation of the image features, after preprocessing [19]. The fourth module is dedicated for the extraction of features from segmented images. Fifth module is designed for feature extraction. To extract the appropriate features only, the operation is done by using texon features and curvelet transform-based features. The final and most prominent module is classification module. It is proposed to perform the classification from extracted features of MRI images by using a new CNN-based technique [20]. After preparing the proposed optimisation algorithm, the classifier is to be trained by using it. Hence, the developed algorithm will be the combination of two algorithms. The implementation of this will be on MATLAB and the dataset to be employed in [21]. Analysis of performance based on different parameters is inevitable to know the good and bad of new solution. Accuracy, specificity and sensitivity are to be analysed in depth and breadth. A comparative study is to be performed by using the above-mentioned performance matrices. The proposed algorithm is to be compared with [14, 15] and [18] in depth. The following block diagram depicts the stages of proposed research for brain tumour detection from MRI outputs, in a nutshell (Fig. 1).

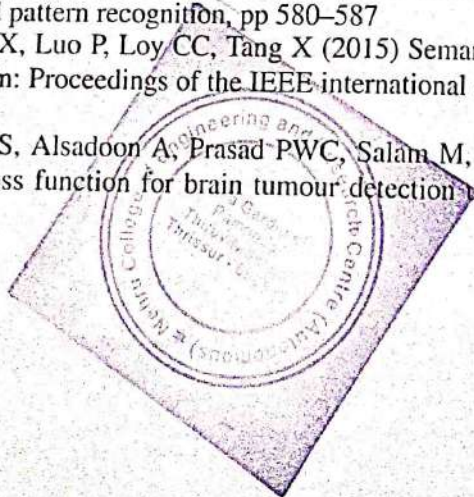
5 Conclusion

The necessity of very reliable and dependable algorithm for the detection of brain tumours from other tissues is the need of the time. There are various studies which are being progressed on this account too. Since even a narrow wrong approximation

may lead to the drastic negative outcomes, which can never be tolerated in the field of medical science, the new and improved algorithms are still relevant to develop. The following conclusions are made, based on the review of various research works. Thresholding method is shown highest effectiveness for the RoI extraction of medical images. For the segmentation process, sparse FCM technique is showing dependably good results. And, for the feature extraction, among all tried methods, curvelet transform is found most reliable one. The most important part of diagnosis is classification. Various advantages and incompatibilities were accounted in the current algorithms. Hence, it is proposed to combine more than one AI-based classification models to develop a dependably good algorithm.

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Paper ID: 59

INTEGRATED SMART BIKE SAFETY SYSTEM WITH ACCIDENT DETECTION

Fathima Sunil, Bayana Azeez, Devajith Sathyan, Aliya Kathoon, Rosamma Sebastian, Indu Reena Varughese

Department of Electronics & Communication
Amal Jyothi College of Engineering

Abstract: The paper introduces a Smart Bike Safety System, powered by an Arduino Uno, that enhances rider safety using advanced sensors and communication modules. Components include an accelerometer, shock sensor, NEO-6M GPS module, and HC-05 Bluetooth module, all compactly powered by a LiPo battery. The system's focus is on accident prevention by analyzing data from sensors to detect significant changes in the bike's motion. In case of an accident, GPS updates the bike's location, and Bluetooth communicates with a dedicated mobile app. The app displays accident alerts, allowing users to confirm or dismiss. Upon confirmation, the system notifies rescue agencies for a prompt emergency response. This system combines real-time sensor data, accurate location tracking, and seamless communication, aiming to enhance rider safety by providing timely alerts and initiating emergency measures in case of an accident.

Paper ID: 84

6G OPTICAL AND WIRELESS COMMUNICATION NETWORK FOR IOT APPLICATIONS

A Anakha, R Rajkumar, Mredhula L
Department of Electronics & Communication
NCERC, Pampady

Abstract: 6G, the future of wireless communication networks, is poised to redefine the landscape of IoT (Internet of Things) applications by delivering unparalleled capabilities in terms of data rates, low latency, and massive device connectivity. This is a succinct overview of the potential of 6G optical and wireless communication networks in powering advanced IoT applications. The merging of optical and wireless technologies in 6G presents a potential solution for meeting the varied demands of IoT applications, encompassing ultra-high data rates, minimal latency, energy efficiency, and strong security. The synergy between optical and wireless communication technologies is emphasized, presenting a seamless and high-performance connectivity paradigm for the vast array of IoT devices.

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goal of CPR is to maintain blood circulation and supply vital organs with oxygen until professional medical help arrives. CPR is a critical skill that can be learned through formal training courses. This paper propose a frugal device with optimized assistance in the CPR procedure. This device continuously monitors the pressure of the compression and whenever the pressure exceeds the threshold value, the airbag deflates thereby damping the excess pressure, reaching the optimum value.

Paper ID: 198

ADVANCED BIOSENSORS FOR VARIOUS VIRUS DETECTION

Ambika S, Anooja B

Department of Electronics & Communication
NCERC, Pampady

Abstract: For the past few decades, the mankind has been prone to many deadly viruses, which are still a threat to our survival. Influenza, Ebola, Zika, Nipah, and recently Covid-19 and some of the major viruses that cause pandemic and epidemic across the global. But vaccines and necessary. For effective hold, early detection are required, false results and late results cause risk in peoples' lives. In this paper we are going to see the recent developments in the biosensors to detect the viruses. Electro-chemical based micro-biosensors, protein-based, nano-photonic based, DNA based, nanomaterial based biosensors are developed on reduced size, low cost for detection. A detailed look and understanding about these sensors are featured here. As in future more ideas incorporating IoT can be done for effective detection

Paper ID: 201

COMPACT AND WEARABLE VENTILATOR SYSTEM FOR ENHANCED PATIENT CARE

Ajay Krishna K, Anuchand P C, Sanjay M, Sreelakshmi V N, Asha Arvind, Dr. V. Balamurugan

Department of Electronics & Communication
Ahalia School of Engineering & Technology

Abstract: Developing an innovative response to the challenges presented by the COVID-19 pandemic, our initiative strategically addresses the pressing issue of ventilator shortages and the intricacies of patient care within medical facilities. The primary focus is on the creation of a compact and wearable ventilator using embedded systems technology. Inspired by the surge in mechanical ventilator designs during the pandemic, our proposed system evolves from a simple, cost-effective device to a sophisticated solution tailored to meet the specific demands of pulmonologists and medical practitioners. The urgency in healthcare, compounded by the limited availability of ventilators, underscores the critical need for a portable and effective solution. Traditional ventilators are complicated due to challenges such as size, weight, cost, and complexity, confining their use to medical facilities and elevating the risk of secondary infections. To combat these issues, our project seeks to design a smaller, more accessible

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2	SAJITHA A S		Fractal-Enhanced Micro-strip Antennas: Miniaturization, Multiband Performance and Cross-Polarization Minimization for Wi-Fi Applications		INTERNATIONAL CONFERENCE RECENT ADVANCE IN SCIENCE AND ENGINEERING		Oct-23		NCERC	



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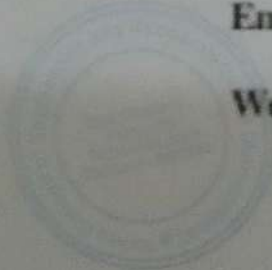
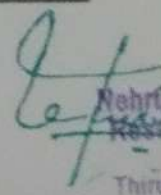
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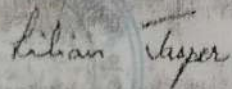
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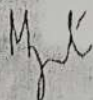
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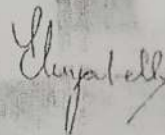


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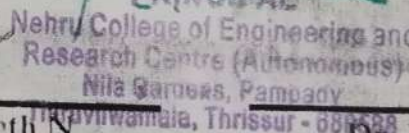
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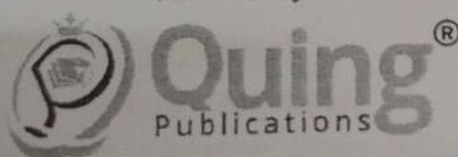
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I. Introduction

Forests play a crucial role in environmental preservation and combat greenhouse effect. Admittedly, human interventions like deforestation, wildfire, and so on are constantly reducing them. Deforestation is amongst the

most serious environmental challenges today. Large number of acres of forest are lost each year around the entire globe, so people must act quickly to save them. Fortunately, new technology can aid in the preservation of forests. The term "digitalization of forests" refers to the long-term integration of cutting-edge technological advances into forests in order to improve current trends in forest surveillance applications, data capture, and interpretation in the field of science and technology.

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