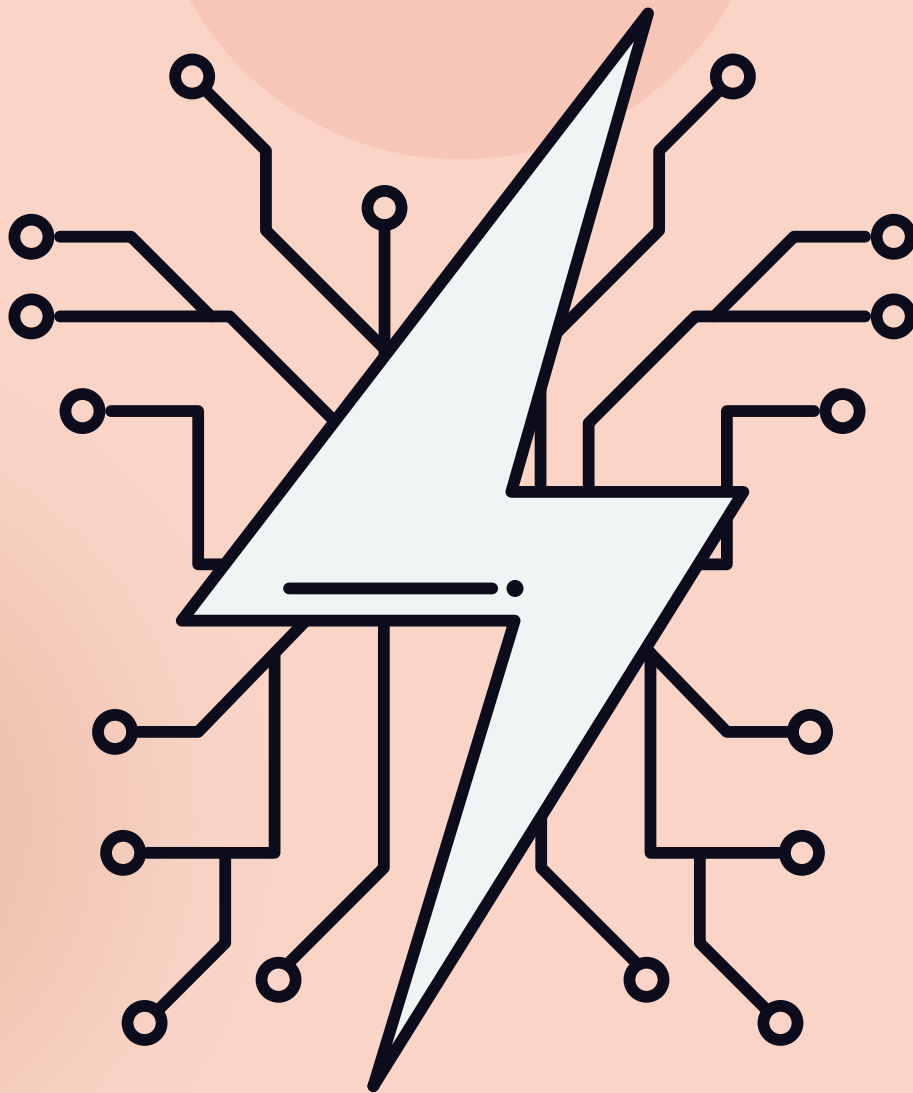


Edition : 2021-22

Part - 1

ECE

Techno Chronicle



Department Of Electronics & Communication Engineering



**DR.K.V SUBBA REDDY
INSTITUTE OF TECHNOLOGY
(AUTONOMOUS)
NH-44, Kurnool, Andhra Pradesh**

TECHNO CHRONICAL

2023-2024

INSTITUTE VISION

To Be A Global Leader In Imparting Quality Technical Education To Produce Competent, Technically Innovative Engineers Imbued With Research Aptitude, Entrepreneurship And Social Responsibility.

INSTITUTE MISSION

1. To Nurture The Students With Fundamental Engineering Knowledge Enriched With Technical Skills.
2. To Create Conducive Environment To Nurture Innovation And Interdisciplinary Research.
3. To Develop Professionals Through Innovative Pedagogy Focusing On Individual Growth, Discipline, Integrity, Ethics And Social Responsibility.
4. To Foster Industry-Institution Partnerships Leading To Skill Development And Entrepreneurship.

ECE DEPARTMENT VISION:

To Strive Towards Excellence In Electronics And Communication Engineering Through Teaching, Experimental Learning And Research To Meet Industrial And Societal Needs

ECE DEPARTMENT MISSION:

M1: To Provide Appropriate Facilities And Environment For Effective Teaching- Learning Process.

M2: To Create Interdisciplinary Research Ambience To Nurture Innovative And Research Skills.

M3:: To Incorporate Interpersonal Skills, Professional Integrity, Ethics And Societal Responsibility.

M4: To Imbibe Entrepreneurship Skills And Leadership Qualities.

About ECE Department :

The Department Of Electronics And Communication Engineering Has Been Playing A Vital Role In Producing Quality Engineers Ever Since It Was Established In The Year 2007. The Department Runs One Under Graduate Program And Two Post Graduate Programs To Cater To The Ever – Changing Needs Of Technical Excellence In All Areas Of Electronics And Communication Engineering Such As VLSI & Embedded Systems, Telecommunications, Signal Processing Etc. The Intake For Under Graduate Program (B. Tech) Is 120. The Department Also Offers Post Graduation Programs With Specialization In Digital Electronics And Communication Systems (DECS) With An Intake Of 18 And VLSI & Embedded Systems Design With An Intake Of 24.

The Department Headed By The Professors, Associate Professors, Assistant Professors Who Are Experts In Their Respective Disciplines. The Department Has Got Every Facility To Groom The Students As Per The Demands Of The Industries And Mncs. The Department Has Highly Modernized Laboratories With Sophisticated Equipment, Which Improves The Practical Working Competency In The Students And The Confidence.

The Department Aims At Educating And Training Students With Sound Knowledge And Awareness In The Latest Trends In Electronics And Communication Engineering. The Regular Interaction Session With Eminent Professors From Reputed Universities Create Awareness In The Student About The Latest Developments In The Field Of Science And Technology. This Helps Students To Fix Up Their Right Goals For Their Bright Future.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO1: Graduates Of The Program Will Have Strong Fundamental Knowledge In Electronics And Communication Engineering, Analytical, Critical Reasoning And Problem-Solving Skills To Develop Innovative Solutions (Continuing Education).

PEO2: Graduates Of The Program Will Be Professionally Progress In Electronics, Communication, Signal Processing, VLSI, Embedded Systems And Related Areas With An Inclination Towards R&D And Lifelong Learning (Excellence In Career).

PEO3: Graduates Of The Program Will Have Entrepreneurship Skills, Leadership Qualities To Work With Diversified Teams In Multidisciplinary Environment (Leadership And Multi-Disciplinary).

PEO4: Graduates Of The Program Will Be Professionally Deft And Intellectually Adept To Develop Solutions To Complex Engineering Problems With Professional Ethics And Societal Responsibility (Contribution To Society).

PROGRAM SPECIFIC OUT COMES (PSOS)

PSO1: Design Problems Related To Electronics, Communications, Signal Processing, VLSI And Embedded Systems.

PSO2: Analyze And Solve The Complex Communication Engineering Problems In Architecture Design And Computer Networking.

PSO3: An Ability To Use Modern Software Tools To Analyze, Synthesize And Evaluate VLSI And Communication Engineering Systems For Multidisciplinary Tasks.

ACKNOWLEDGEMENT

We Extend Our Sincere Thanks To

Honorable Chairman
Dr.K.V.SUBBA REDDY

Secretary & Correspondent
SMT.S.VIJAYALAKSHMAMMA

Principal
Dr.J.KANNA KUMAR

HOD
Dr.M.V. SRUTHI

All Our Staff Members For Their Humble
Co- Operation And Involvement In Their Creation Of Bytes,
For The Year 2023-2024



MESSAGE FROM THE CHAIRMAN

It's Been A Real Pleasure To Know That The Department Of ECE Is Hosting Their First Ever National Level Technical Symposium "TECHNO CHRONICAL", AND I' Am Glad To Hear That It Is Being Organized Wholly For The Students With Guidance Of The Staff Members. Such Combined Effort Is Always Encouraged And Bring Out Good Results.

The Department Of "Electronics And Communication Engineering" Has Always Conducted Activities Which Helps In Development Of Students Into Leaders, I Hope "TECHNO CHRONICAL"2024 Is A Huge Success And Adds A New Star In The History Of The Department.

With Regards
Dr. K.V. Subba Reddy ,Founder–Chairman,
Dr.K.V.Subba Reddy Institute Of Technology,
Kurnool-518218,



MESSAGE FROM THE CORRESPONDENT

I Feel Very Proud That The Department Of ECE Is Organizing Nation Level Technical Symposium“ TECHNO CHRONICAL”On 2021-22 The 21st Century Is Advancing Rapidly By Multipronged Scientific Inventions And Discoveries In That The Electronics And Communication Engineering Is Playing They It All Role In All Scientific Developments. The Has Com That Without Electronics And Communication Engineering Nothing Is Going To Move I This Universe. In This Perspective The Contribution. The Development Of Society By This Departments Vital In All Sphere Of Life. I Heartily Wish The Staff And Students Of The Department In Their Endeavor To Bring In A House Magazine Which Will Otherwise Contribute To The Highest Learning Of This Magnificent Engineering.

With Regards

Secretary &Correspondent
SMT.S.VIJAYALAKSHMAMMA,
Dr. K.V.Subbareddy Institute Of Technology,
Kurnool- 518218



MESSAGE FROM THE PRINCIPAL

Dear Friends, Greetings From DR.KVSRIT, Kurnool. Engineering Is A Human Activity Aimed At Creating New Artifacts, Algorithms, Processes And Systems That Serve Humans. An Engineer Seeks To Create What Never Did Exist. It Is A Privilege In Any One's Career To Embark On Engineering Education. At Dr.K.V, Subba Reddy Institute Of Technology, Our Vision Is "To Be A Global Leader In Imparting Quality Technical Education To Produce Competent, Technically Innovative Engineers Imbued With Research Aptitude, Entrepreneurship And Social Responsibility. On The Academic Front, We Have Provided The Best Quality Class Rooms, Laboratories, And Library Facilities.

With Regards
Dr.J.Kannakumar,
Principal
Dr.K.V.Subbareddy Institute of Technology,
Kurnool- 518218,



MESSAGE FROM THE HOD

The Department Of Electronics And Communication Engineering Believe In Imparting Excellence In Education By Keeping Our Students In Pace With Industry Demands. The Department Is Equipped With Best Lab Facilities Having Latest Software And Hardware To Provide Industry-Oriented Knowledge To Our Students. The Department Consists Of Highly, Energetic, Dynamic, Well-Experienced, Qualified As Well As Young Faculty Members Who Also Work As Mentors To Turn Students To Professionals By Grooming Their Technical Skills As Well As Their Innovative Capabilities.

With Regards

Dr.M.V. Sruthi,

ECE-HOD

Dr.K.V.Subbareddy Institute Of Technology,

Kurnool- 518218,

ABOUT DRKVSRLT:

Dr. K. V .Subba Reddy Institute Of Technology Is Promoted By Vaibhav Educational Society (VES) With The Motto Of “Work Is Worship“. Its Prime Objective Is To Offer Quality Education For The Betterment Of Society. It Persistently Seeks And Adopts Innovative Methods To Improve The Quality Of Higher Education On A Consistent Basis. The Campus Has A Cosmopolitan Atmosphere Of Attracting Students From All Corners Of Andhra Pradesh. Faculty Are Continuously Encouraged To Conduct Research, Pursue Higher Education And Nurture The Students. Our Memoranda Of Understanding With Various Industries Are Our Major Strength. Many Of Our Students, Who Pursue Their Jobs In Various Industries Bring High Quality To Their Work And Add Value And Esteem To Their Organizations. With Steady Steps, We Continue Our March Forward.

HISTORY OF DRKVSRLT

Established In 2007, DRKVSRLT Is Affiliated To Jawaharlal Nehru Technological University (JNTU), Ananthapuramu, And Is Approved By The All India Council For Technical Education (AICTE), New Delhi. The College Is Headed By Its Founder And Chairman, Dr. K. V. Subba Reddy. In Recognition Of His Outstanding Service To India In Offering Quality Education, He Is Conferred With Jewel Of India Award By Indian Solidarity Council On 13th March 2006. He Is Also Conferred Life Time Achievement Gold Medal Award By International Institute Of Education And Management On 13th March 2016. Smt. Vijaya Lakshamma Is The Secretary And Correspondent. Dr.J.KANNA KUMAR Is The Principal.

Technical Magazine 2021-2022
Department of Electronics and Communication Engineering

S.NO	TITLE OF THE ARTICLE
1	IMPLEMENTATION OF TELE PRESENCE DEVICE USING RPI
2	RESPIRATORY ELECTRO MYOGRAM DENOISING USING HYBRID SIGNAL PROCESSING TECHNIQUE
3	RECONFIGURABLE BANDSWITCHING ANTENNA FOR MILLIMETER WAVE APPLICATIONS
4	PLANT LEAF DISEASE DETECTION USING LDD NET
5	BRAIN TUMOR CLASSIFICATION USING MACHINE LEARNING TECHNIQUES
6	IMPLEMENTATION OF QOSA WARE TRUST BASED ROUTING ALGORITHM FOR WSN'S
7	ISOLATION ENHANCEMENT IN MIMO ARRAYS FOR UWB APPLICATIONS
8	REDUCTION OF MUSCLE ARTIFACTS IN SCALP EEG SIGNALS USING A HYBRID APPROACH BASED ON VARIATION MODE DECOMPOSITION
9	IMPLEMENTATION OF OMP ALGORITHM ON FPGA
10	IOT ENABLED VERTICAL FARMING MONITORING SYSTEM USING BIG DATA ANALYTICS

1. Implementation of Tele presence Device using RPI

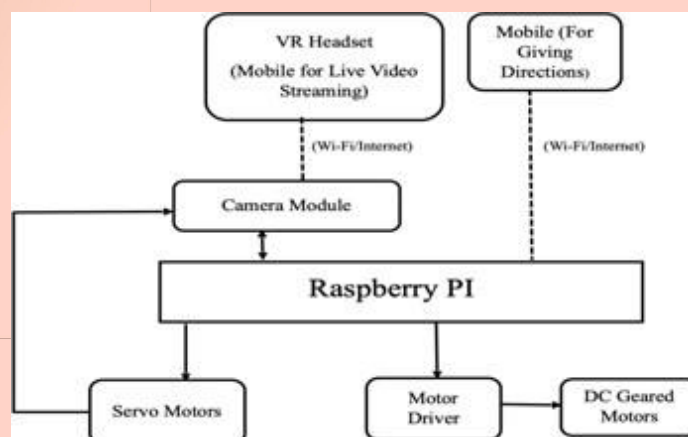


Dr.M.V.Sruthi
Associate Professor & HoD

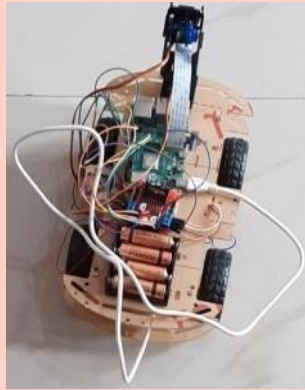
Tele operation allows human operators to perform unreachable or hazardous tasks at a remote distance. As a person cannot go every location in the hazardous situations. In circumstances like fire accidents or to provide site monitoring for military operations and to face the critical challenges in such scenarios, this device helps them to face the challenges at such times. A tele presence device is significantly different from traditional videoconferencing. This innovation uses video in real-time and permits individuals to be practically present in a distant or remote location, which gives feedback depending on the operator's head movement. To make this possible, the Raspberry Pi is configured as a server. A smart phone can be used to operate this device that is located in a far away place. The data is shared between the smart phone and the device by utilizing virtual network computing. The accelerometer determines the camera's rotation, with the help of user head movement.

Introduction: Video conferencing device that changes the way you perceive helps people to be in more than one place at once. Raspberry pi allows easy video transmission over Wi-Fi. The Raspberry pi is considered as the CPU of the tele presence device. This device has a wide range of usage in medical, schooling and low-level virtual reality applications. The IMU app supports an accelerometer, gyroscope, and magnetometer that is made to run in the background. The values from this appear sent to there as rasp berry this makes servos move up and down.

Methodology: Initially, the smart phone is placed in a headset. The phone's screen is set to dual screen mode. The Inertial Measurement Unit (IMU) app and the Wi-Fi Command Center app are installed on the mobile device. According to the user head movement the IMU app helps in the measurement of accelerometer, magnetometer, and gyroscope values. These values are sent to the Raspberry Pi via Wi-Fi. These values are taken, and output angle is generated based on the programs that have been written. The output is routed to the servo motor and the L298N motor driver IC, after which it is routed to the DC geared motors. A servo motor aids in the rotation of the camera around its axis. The L298N motor driver IC controls the direction and speed of DC motors. DC motors are used for the device movement and servo motors are used for precision in angle rotation.



After designing the hardware part, we were successfully able to control the device by integrating it python programs. VNC helped us in accessing the raspberry pi. We are able to control the device from both app and desktop. Real-time head feedback is achieved through the pan tilt stand. IMU app's accelerometer, magnetometer are used for y axis and x-axis values respectively. The operator's desktop also receives the live footage. Since the raspberry pi we used is of 4 GB RAM, the processing speed of it is quite higher than the existing models and able to manage both the operations for movement and real time feedback. This made us to get low latency during live transmission with out any disturbances.



Even though there are various devices and robots coming in the present scenario, tele operation is often over looked. Thus, we are facing a lot of issues in Real-time feed back and immersive technology. But this device helps us to the raise up from that drawback. This robot is simple in design and in expensive. This enables us to be telepresence from afar. It may be used to a wide range of real-world settings. It may be used in a number of industries, including business for virtual meetings, education in schools or colleges, senior care, and defense applications like monitoring, to name a few. This will mark a smallest epin advancement in the metaverse development.

2. Respiratory Electro myogram Denoising Using Hybrid Signal Processing Technique



Dr.Syed Akheel
Professor,ECE

Electromyography (EMG) signal recording equipment is comparatively modern. Still, there are enough restrictions in detection, recording, and characterization of emg signals because of non linearity in the equipment, which leads to noise components. These noises directly degrade the efficiency of EMG processing and affect the accuracy and robustness of systems. Signal processing techniques are effective for denoising EMG signals. Some of the signal processing techniques are high pass filtering, Empirical Mode Decomposition, Wavelet denoising. In this work, to effectively remove the ECG artifacts, a hybrid signal processing technique was implemented which is a combination of high Pass filtering and SWT techniques.

Introduction: Monitoring respiratory activity is a very effective and important tool to control the patient's vital signs in most of medical environments such as operating rooms and intensive care units(ICU's). Unfortunately, the interpretation of EMG measurements of the respiratory muscles is hindered by interference due to cardiac muscle activity. By removal of cardiac artifacts from EMG we can get proper respiratory activity results.

EMG is mostly affected by:

- Power Line Interference
- Baseline Wander noise
- Electro cardiogram noise
- White Gaussiannoise

Methodology:

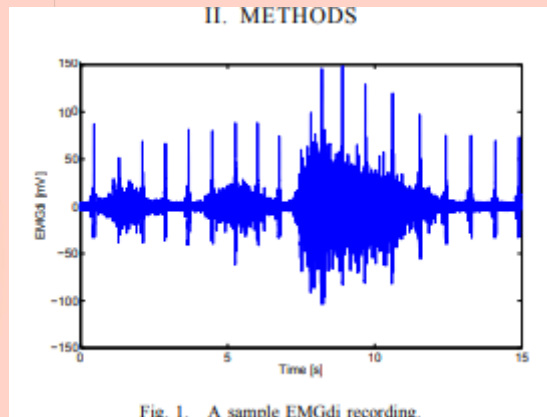
We have chosen two of the signal processing techniques namely High pass filtering and waveletdenoising.HighpassfilteringisstillthegoldenstandardinremovingECGartifacts.Inthesubsequen t analysis, we have considered a fourth order Butterworth high pass filter with a cut off frequency of 175 Hz which is found to perform reasonably well. And then the output of high pass filtering is given as input to Wavelet denoising. Wavelet denoising is a method in which signal is decomposed into several wavelet bands, and a simple threshold is applied in the wavelet domain to detect and remove ECG interference. In this method we used un decimated, shift-invariant form of the wavelet transforms which is also called as stationary wavelet transform (SWT). We make an effort of using hard thresholding technique and a moving median filter to compensate for possiblechangesinthebasicEMGnoiselevelwithinonerecording.Tofurtherstabilizethenoiseestimation, the R peaks can be disregarded in the median filter. The described wavelet based approach yields a denoised version of the ECG component, which is then subtracted from the raw signal to recover the ECG component. From the results, we observed that SNR value as 29db and PM value as 62db

using hybrid signal processing technique (HP+SWT) which is considered to be a better choice to remove ECG artifacts from EMG signal. And these results may vary for different data sets.

Diaphragmatic electromyogram (EMGdi) signals give important information about the respiratory muscle pump, can be used as an indicator of neural respiratory drive, and have been postulated as a method of designing neurally-activated intelligent ventilators. However diaphragmatic EMG signals measured with an esophageal catheter tend to be contaminated by electrical signals from the heart-electrocardiogram (ECG). This paper presents a novel method of rapidly separating and enhancing the Electro myogram signals from the combined EMG and ECG signals recorded from an esophageal catheter based sensor. Independent Component Analysis (ICA) is used to separate the EMG and ECG signals, then further processing is used to extract the frequency of the patient's breathing and the relative magnitudes of diaphragmatic muscle activity. These signals have two applications, firstly in artificial ventilator systems and as a diagnostic tool for health professionals.

The aim of this study was to remove the two principal noises which disturb the surface electromyography signal (Diaphragm). These signals are the electrocardiogram ECG artefact and the power line interference artifact. The algorithm proposed focuses on a new Lean Mean Square (LMS) Widrow adaptive structure. These structures require a reference signal that is correlated with the noise contaminating the signal. The noise references are then extracted : first with a noise reference mathematically constructed using two different cosine functions; 50Hz (the fundamental) function and 150Hz (the first harmonic) function for the power line interference and second with a matching pursuit technique combined to an LMS structure for the ECG artefact estimation. The two removal procedures are attained without the use of supplementary electrodes. These techniques of filtering are validated on real records of surface diaphragm electromyography signal. The performance of the proposed methods was compared with already conducted research results.

II. METHODS



3. Reconfigurable Band Switching Antenna for Millimeter Wave Applications



Dr.S.A.K.Jilani
Professor

The proposed antenna consists of mainly three switches whereas switch 1 is a lumped switch which controls the operating bands of the antenna and switch 2,3 controls the beam switching of the antenna. When the Switch 1 is ON, the proposed antenna covering the 5.28–9.0 GHz wideband. When Switch 1 is OFF, the antenna operates only at 4.8 GHz covering the 4.32–5.28 GHz band. The switch 2 and 3 are always in constant state. The prototype is small in size (21 mm*25 mm*1.6 mm) and light in weight, with switchable millimeter wave applications and frequencies that cover 5G cellular telephony in 24-to-30-GHz bands, as well as UWB operations.

Introduction:

Frequency reconfigurable antennas, which are capable of emitting several patterns at different frequencies and multi band services, have attracted a lot of attention since the introduction of a new class of communications systems. Several antennas with frequency characteristics that can be changed have been designed. Stackable reconfigurable patches are created for several frequencies in a mono structure, with switches controlling the required operation. Reconfigurable frequency slots for UWB and 4G applications have been proposed. This antenna, on the other hand, may be utilized as an RF front end for the 2.3 GHz band. At first, we have analyzed the s_{11} (reflection coefficient) parameter for the designed antenna which is shown in fig.4. When the Switch 1 is ON, the proposed antenna covering the 5.28–9.0 GHz wide band. When Switch 1 is OFF, the antenna operates only at 4.8 GHz covering the 4.32–5.28 GHz band.

Methodology:

The proposed antenna's patch and ground are printed on the 1.6 mm thicker substrate of FR-4 which is having the dielectric constant of 4.4. The geometry of this antenna is 21*25*1.6 (mm³). Different shapes of stubs like I-shaped stub, H-shaped stub, L-shaped stub can be connected with the ground plane to observe the different types of reflection coefficient response for all switching states. In this paper we connected the L-shaped stub in the ground plane. The performance of the antenna is good in terms of reflection coefficient.

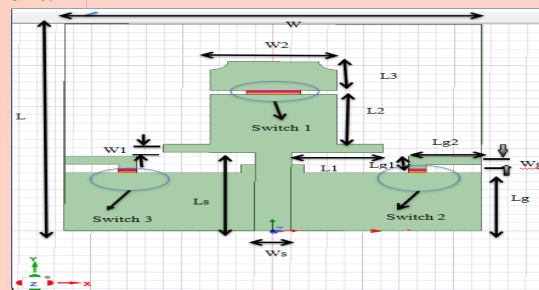


Fig: Proposed antenna configuration.

This design was frequency reconfigurable millimeter wave antenna, which has low profile and small size and it covers bandwidth of 15 GHz to 30 GHz. A switch is used to obtain tri frequency operation which makes antenna to have frequency reconfigurability. The antenna can be used for 5G applications and Omni directional pattern is obtained which makes the antenna suitable to use in any particular direction for communication. The designed antenna is switch dependent and dissimilar performance for ON and OFF states of SWITCH1. The proposed antenna can be function at wounique frequencies, depending on the state of switch1.

4. Plant Leaf Disease Detection Using LDD Net



Dr. Gajendra Kumar
Associate Professor

Over the decades, production in the agricultural sector has decreased due to various factors such as leaf diseases, an overdose of chemical medication, natural disasters, and climatic changes. Majorly, the impact of plant diseases set a huge loss to the farmers compared to other kinds. Consulting an expert is a time taking and expensive process. Many machine learning & advanced deep learning algorithms are being implemented to identify diseases, more accurately, using the infected plant leaf image. The objective of this paper is to introduce a light weight leaf diseases detection Neural Network (LDD Net) that should be able to distinguish between diseased and healthy plants. The dataset contains 33 classes of different diseased and healthy plant leaves images, where each class has 1,680 training and 420 validating images. The accuracy obtained by the proposed LDD Net model is 99.30%. Since the performance of the model is high, it can be implemented in daily life to monitor plant diseases to have a healthy crop yielding.

Introduction:

The most effective way to detect the disease is using computer-based knowledge, such as image processing techniques and computer vision, in which the image of plant leaves is involved in the detection. The improvement of technology and detection techniques in image processing revolutionized in improving accurate detection. Initially, many machine learning algorithms came into use but later on, as technology advanced; many advanced machine learning concepts arrived and replaced traditional machine learning algorithms. This paper introduces a deep learning model called LDD Net, which was referenced from the Residual Network (Res Net) architecture, and presents an overview of its performance in classifying unseen data.

Methodology:

LDD Net architecture, Figure 1, has 11 layers of which 10 are convolution layers and a fully connected layer block. LDD Net, which was referenced from Res Net architecture, avoids the vanishing gradient problem by enabling gradients to flow through the skip connection. In addition to it, LDD Net uses ReLU as activation function instead of the sigmoid. The sigmoid activation function enhances values nearer to zero and suppresses values farther from zero. Unlike sigmoid, ReLU enhances positive values and suppresses non-positive values. To prevent deep neural network architectures from over fitting, gradients must flow through the network, and in such cases using sigmoid degrades model performance. The output of the sigmoid function, when used as an activation function, is always less than 1, figure 2(a). In neural networks, gradient gets multiplied many times to get the gradients of lower layers while back propagation, hence making it even less. Thus resulting in minimal or no change in the layer weights. Such issues can be avoided using ReLU activation functions since the derivative of ReLU is 1 for all positive values, figure 2(b). LDD Net has both ReLU activation function and skip-connections hence making it flexible and reliable to use in real-life applications. Accurate classification of plant leaf disease is very essential to look for plants and soil health. The proposed novel architecture, LDD Net, can identify 24 different plant leaf diseases and 9 healthy plants with an accuracy of 99.30%. LDD Net is extended further by developing a web application so users can access it easily at any time. As the model is efficient enough to detect unseen data successfully, farmers

5. Brain Tumor Classification Using Machine Learning Techniques



Dr.S.Venkatesan
Associate Professor

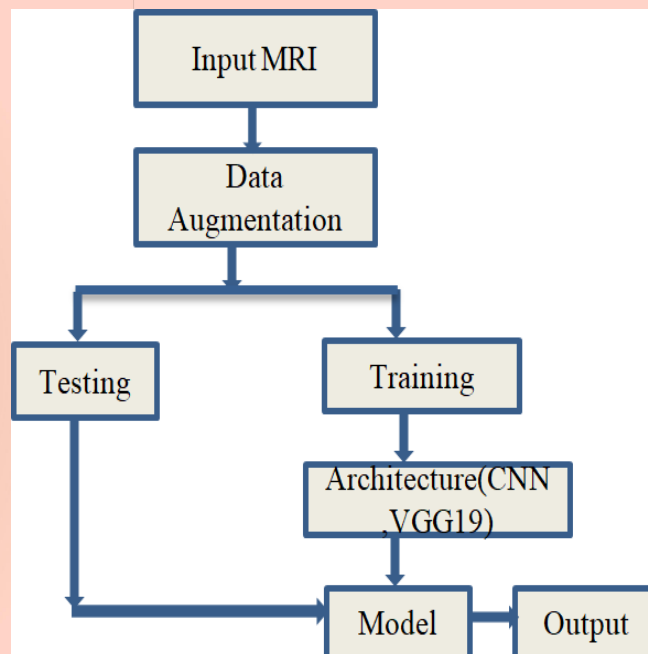
Brain tumor is a collection of abnormal cells in our brain. This project is also conveyed us by knowing, artificial intelligence is helpful in solving real life problems. To identify the brain tumor, scanned MRI images are given as the input. The Algorithms we are using here are machine learning algorithms like SVM with 80% accuracy, deep learning algorithms like CNN with 94% accuracy and transfer learning algorithms like VGG19 with 96% accuracy.

Keywords: MRI, SVM, CNN, VGG19, Artificial Intelligence

Introduction:

The abrupt and unusual extension of tissues in brain is called as tumor. Benign: Cells are not cancerous and won't spread. Malignant: Cells are cancerous and can spread to other tissues and organs.

Methodology:



This methodology gives us the way to find the Brain Tumor by using some classification algorithm and methods. Classification and detection of Brain Tumor through some automatic technique is beneficial as it requires a large amount of work of monitoring by doctors, and at very early stage itself it detects symptoms of diseases means we can cure easily. Among all the three classification methods used for classifying brain tumor, transfer learning algorithm namely vgg19 has shown the most appropriate results.

6. Implementation of QoS aware Trust Based Routing Algorithm for WSN's



Gundala Vasanthi

Assistant Professor

In WSN, the main reasons for the effective design of protocol are to have minimal energy consumption and security. So to address these issues, we propose a new routing protocol called Secured QoS aware Energy Efficient Routing protocol, which will be designed based on trust and energy modeling. In this, the trust modeling uses an authentication technique with a key based security mechanism to provide trust scores, the trust scores will be calculated in this work for enhancing the security. In addition, a cluster based secure routing algorithm has been suggested in which cluster head has to be selected based on QoS metrics and trusts cores.

Proposed Algorithm

Algorithm for Cluster head

Selection:

Input: S - set of nodes in a cluster

Output: Elected cluster head(u)

Step0: Assign the trust score to 0 for all the nodes

Step1: for each node in S calculate the Overall Trust value(OTV).

Step2: for i=1 to

S; if $OTV(i) < \text{Threshold}$ then remove it from the cluster; Else Step4: Assign_role(i, CH)

Step5: for j=1 to N_i ; if $OTV(j) < \text{Threshold}$ then remove it from the cluster Step7: if $i < j$

Step8: if $(\text{HopCount}(i) > \text{HopCount}(j))$ and $(\text{Coordprob}(i) \leq \text{Coordprob}(j))$ and $(OTV(i) < OTV(j))$ then

Step8.1: Assign(Role(i), Member)

end if and end for

Step9: if role i=CH then

Step10: Add (NID(i), Cluster Headset(C))

end if and end for

Step11: Node u with maximum Cordero and maximum trusts core in the set C will form the Cluster Head.

Step12: Announce Cluster_Head_condition S

tep 13:Other_nodes(C–Members) **Secured**

Routing Algorithm

Step1: Source nodes discovers the path to the sink

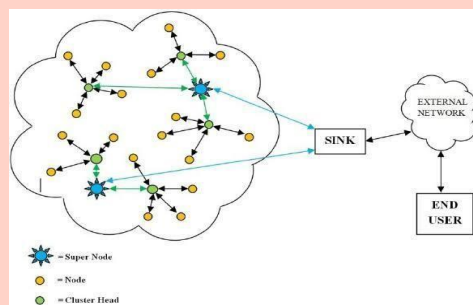
Step2: For each path find the PTS

fromsourcetosinkStep3:IfPTSsd>Threshold Then

Step 4: Add this route to the qualified route set Q

end if and end for

Step5:If more than one route in Q,then select the route with maximum energy and minimum hop countas a final route from sources to destination .



This algorithm provides better performance in terms of increase in packet delivery ratio, network life time and provides reduction in delay. From this project, we can able to increase security and reduce energy consumption.

7. Isolation Enhancement in MIMO Arrays for UWB Applications



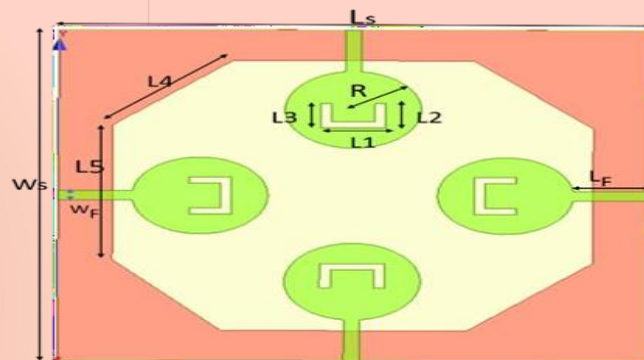
K.Kishore
Assistant Professor

In this design the four elements orthogonal in terms of polarization via placing U-shaped slots at the center of each radiator. In order to validate the technique, a two-element MIMO antenna placed orthogonally is designed, and simulated. The fraction of MC decreased is achieved via placing U-shaped stubs at the center of each of the circular patch elements which in turn helps to modify the antenna polarization. An effective technique is proposed which decreases the mutual coupling between four orthogonally placed strip line-fed micro strip elements operating for the UWB frequency range in MIMO configurations.

INTRODUCTION:

The MIMO(Multiple-Input Multiple-Output) antennas are considered as better candidate for 5G applications. The use of MIMO antenna is an effective way to improve link reliability and increase the spectral efficiency of radio communication. The MIMO techniques enable the transmission of data over multiple channels and thus increase the channel capacity with out additional power requirements.

ANTENNADESIGN:



A new patch antenna technique on U-Shaped slots is planned in this paper. A MIMO antenna with four elements is developed .Elements are isolated by 15.5mm from edge to edge. The use of U-shaped slots can considerably minimize MC to -40 dB, according to simulation data. The antenna design performance in terms of radiation patterns ,ECC,DG was also studied.

8. Reduction of Muscle Artifacts in Scalp EEG Signals using a Hybrid Approach based on Variation Mode Decomposition



P. Jayarami Reddy
Assistant Professor

Electroencephalography (EEG) is a medical test that uses electrodes on the scalp surface to capture brain activities. EEG is chosen in many domains, including Neuroscience, Psychology, and Clinical Research, due to its non-invasiveness, low cost, and portability. It plays a major role in the diagnosis of a variety of brain illnesses, including insomnia, epilepsy, Alzheimer's disease, depression, and dementia. Despite many advantages, while recording, artifacts always corrupt the EEG signals. Artifacts are false signals produced by sources besides the brain. Artifacts are categorized into physiological (ocular, muscular, and cardiac) and non-physiological (surroundings, electrodes). Artifacts, on the other side, have an impact on the actual EEG signal. Several approaches have been developed over the years to detect and eliminate this distortion, including regression, filtering, blind source separation, and wavelet methods. These methods require prior information or a reference channel. We proposed a hybrid approach VMD-CCA-SWT for the removal of muscle artifacts.

Introduction:

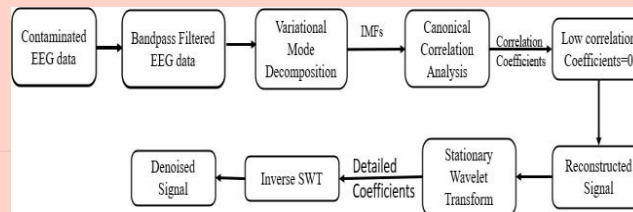
The electroencephalogram (EEG) is a recording of the electrical activity of the brain from the scalp. It helps to diagnose many brain disorders such as Parasomnia, Depression, Epileptic activity, etc. EEG signals from various lobes of the brain's cerebral cortex over a frequency range of between 0.01-100 Hz. While, Intra-cranial EEG refers to recording EEG signals by placing electrodes directly on the brain's exposed surface, which is an invasive technique. Artifacts are the undesired noise signals that originate due to body movements, external disturbances, etc. Artifacts may degrade the EEG signals of interest, which can be classified as physiological and non-physiological. Physiological artifacts, such as ocular, muscular, or cardiac artifacts, are caused by physical activities. Non-physiological artifacts evolve due to external factors such as device faults, voltage fluctuations, etc. Muscle artifacts are caused due to muscle movements such as walking, chewing, swallowing, etc. Ocular artifacts are caused due to eye blinking with an amplitude of 100-200 microvolts. Cardiac artifacts arise due to a high heart rate with an amplitude of 1-5 microvolts. Many studies have shown that among the three artifacts, ocular and cardiac are somewhat easy to remove compared to muscle artifacts because they overlap with all EEG bands due to their broad frequency range with an amplitude of 100 microvolts, because such errors decrease the effectiveness of disease diagnosis as well as several other areas, making the elimination of these artifacts the most difficult issue in EEG signal analysis.

Methodology:

VMD is a non-recursive, adaptive sparse signal decomposition technique with few parameters. Because the 1D-VMD was created to work in two dimensions, it's suitable for picture analysis. To order to achieve the analytic signal in 1D, negative frequencies are suppressed; however, in 2D, one half-plane in the frequency domain must be set to zero. In CCA the original signal was used as the first data set, while the time-scaled version was used as the second data set. It uses SOS to determine mutually uncorrelated and maximally auto-correlated sources and ranks them in order of least to greatest autocorrelation.

SWT decomposes a signal into high and low-frequency components called detail and approximation coefficients, bypassing it through high-pass and low-pass filters. The key advantage of SWT is that it overcomes DWT's translation invariance by removing down samplers as well as up samplers. As a result; the SWT coefficients have the same number of samples as the original signal.

Block diagram:



We proposed a hybrid approach based on VMD CCA SWT to suppress muscle artifacts in EEG. We utilize VMD to decompose each channel of EEG signal into multiple IMFs, then use the auto correlation value as a criterion to select the IMFs suspected of muscle artifacts, and then combine these IMFs as a new data set, using CCA to decompose it into several un correlated components and the autocorrelation values decrease in turn so that some EEG components can be retrieved. By setting the component determined to be artifacts to zero, the signal is then applied to SWT to remove the low-frequency components. The signal is decomposed into 3 levelled detailed and approximation coefficients and then we have applied a universal hybrid threshold method it can either be applied to ac or dc coefficients based on the requirement, here we are applying to the Dc coefficients then inverse swt is applied to the signal finally to suppress artifacts we have subtracted the denoised swt signal from the denoised cca signal with that the artifact-free EEG signals are obtained. EEG can be reconstructed.

9.Implementation of OMP Algorithm on FPGA



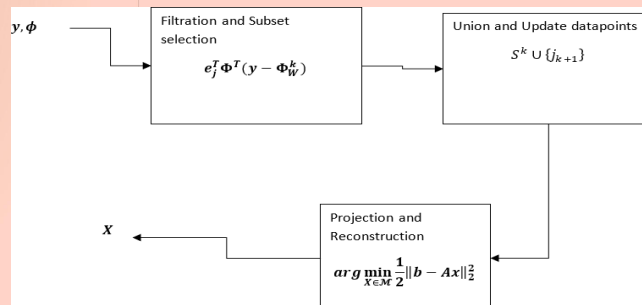
T.Vijay Kumar
Assistant Professor

To provide an effective solution for both image and biomedical signal reconstruction, Modified Orthogonal Matching Pursuit (MOMP) was implemented. During their construction process parity of the image is reluctantly minimized .Sparsely protected in format construction algorithm needs is applied and the comparison performed between existing approaches with metrics like CR, PSNR, SSIM. So, the proposed approach comprises identification of nonlinearity and the dynamically adjusted CR was adopted. The proposed model is effective in CR by 10%, PSNR by 25.63% and SSIM by 1.37%.

Introduction: To address insufficient recovery is through iterative calculations from Nyquist rate, modified approach to find out the assist of the - sparse signal constantly leads to the phenomenal approach of Orthogonal Matching Pursuit algorithm. Development progressed on both images and bio-medical signals such as ECG their reconstructions and output parameters are specified .Such one pictorial comparison is depicted following Original, Reconstruction by OMP and MOMP Prospectively.



Methodology: Many advances had been obtained in MOMP from the OMP calculation. MOMP begins from the zero arrangement same as in OMP and instates the leftover with the estimation vector. Toward the finish of each cycle, MOMP gives the suitable bet as for the subset of chose word reference additives by means of making the built up symmetrical to the picked phrase reference components. The main advantage of MOMP over OMP is that it converges in a fewer number of iterations.



In mild of scanty portrayal order calculation, a MOMP is proposed to attend to the problem of low accuracy and questionable limitations of insatiable calculations in me agree arrangement. MOMP calculation affords the scarcity assessment step. Trial consequence display that the presentation of MOMP calculation is superior to that of others similarly developed OMP calculations.

10.IOT-Enabled Vertical Farming Monitoring System Using BigData Analytics



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The land that is allotted for agriculture purpose is currently very less when compared to the land that is needed for population requirements. Vertical farming is one of the solutions that can be implemented to overcome this problem, where the plants are grown in vertical stacks and it can be done in any building or container. We are implementing CEA technology where the environmental factors such as temperature and humidity of the agricultural can be controlled and monitored by us. We're making use of IOT in order to connect our technology to our farming setup. The data will be uploaded into the cloud and analyzed by Big Data Analytics using various algorithms so that other people can make use of the data.

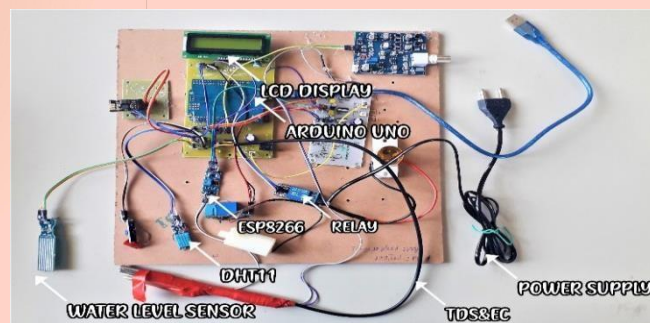
Keywords-Vertical Farming;IoT;CEA;Big Data Analytics.

Introduction:

The system is implementing IOT technology for this agriculture method to increase the convenience of these modern methods. The idea is all about technological arrangement in the vertical farming for monitoring purpose using Internet of Things (IOT) and making use of Big Data Analytic algorithms for making necessary error corrections in the values of pH and E.C of the hydroponic solution.

Methodology:

There are 6 sensors in the sensor interface segment: pH sensor, water level sensor, temperature sensor and humidity sensor, TDS & EC meter and LDR sensor. These sensors are connected to Arduino Uno along with Node MCU i.e., Wi-fi module. The Node MCU is communicated with Things Speak platform for uploading the sensors data that connected to the Wi-Fi network. The values in the cloud after many observations with various factors are stored in the cloud and can be easily given as input to the Big Data Analytic algorithm, Linear Regression in this case to be precise and the optimum values can be determined.



After installation of all the devices in the hydroponic system the values from all the sensors is shown in Thing Speak platform in the form of graphs. The goal of this research was to create an Internet of Things (IoT) based Hydroponic system that uses a web server to monitor and adjust air temperature, humidity, nutrient solution pH, and LED light intensity. IoT is a rapidly growing technology, and hydroponics is a smart technique to produce higher-quality crops

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