MOHAMED SATHAK A J COLLEGE OF ENGINEERING
Sponsored by Mohamed Sathak Trust
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
Siruseri IT Park, Egattur, Chennai 603 103

B.E – ELECTRONICS AND COMMUNICATION ENGINEERING

S.NO	Name of the course that include experiential learning through Project work/ Internship
1	IT6005- Digital Image Processing
2	EC6001- Medical Electronics
3	EC6701-RF And microwave Engineering
4	EC6502- Digital Signal Processing
5	EC6303-Signals and Systems
6	EC6703- Embedded and Real Time Systems
7	EC6405- Control System Engineering
8	EC6801- Wireless Communication
9	EC6504- Microprocessor and Microcontroller
10	EC6201 - Electronic Devices
11	EC6601- VLSI Design
12	EC6602- Antenna and Wave Propagation
13	EC6007 –Speech Processing

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MOHAMED SATHAK A J COLLEGE OF ENGINEERING

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	IT6005	Digital Image Processing	Digital Image Fundamentals, image enhancement, Segmentation, Deduction of discontinuities, edge linking and boundary deduction, region based segmentation,

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IT6005	DIGITAL IMAGE PROCESSING	L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn digital image fundamentals.
- Be exposed to simple image processing techniques.
- Be familiar with image compression and segmentation techniques.
- Learn to represent image in form of features.

UNIT I DIGITAL IMAGE FUNDAMENTALS **8**

Introduction – Origin – Steps in Digital Image Processing – Components – Elements of Visual Perception - Image Sensing and Acquisition - Image Sampling and Quantization - Relationships between pixels - color models.

UNIT II IMAGE ENHANCEMENT **10**

Spatial Domain: Gray level transformations - Histogram processing - Basics of Spatial Filtering- Smoothing and Sharpening Spatial Filtering - **Frequency Domain:** Introduction to Fourier Transform – Smoothing and Sharpening frequency domain filters - Ideal, Butterworth and Gaussian filters.

UNIT III IMAGE RESTORATION AND SEGMENTATION **9**

Noise models - Mean Filters - Order Statistics - Adaptive filters - Band reject Filters - Band pass Filters - Notch Filters - Optimum Notch Filtering - Inverse Filtering - Wiener filtering **Segmentation:** Detection of Discontinuities-Edge Linking and Boundary detection - Region based segmentation- Morphological processing- erosion and dilation.

UNIT IV WAVELETS AND IMAGE COMPRESSION **9**

Wavelets - Subband coding - Multiresolution expansions - **Compression:** Fundamentals - Image Compression models - Error Free Compression - Variable Length Coding - Bit-Plane Coding - Lossless Predictive Coding - Lossy Compression - Lossy Predictive Coding - Compression Standards.

UNIT V IMAGE REPRESENTATION AND RECOGNITION **9**

Boundary representation - Chain Code - Polygonal approximation, signature, boundary segments - Boundary description - Shape number - Fourier Descriptor, moments- Regional Descriptors - Topological feature, Texture - Patterns and Pattern classes - Recognition based on matching.

TOTAL: 45 PERIODS

OUTCOMES:

Upon successful completion of this course, students will be able to:

- Discuss digital image fundamentals.
- Apply image enhancement and restoration techniques.
- Use image compression and segmentation Techniques.
- Represent features of images.

TEXT BOOK:

1. Rafael C. Gonzales, Richard E. Woods, "Digital Image Processing", Third Edition, Pearson Education, 2010.

REFERENCES:

1. Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, "Digital Image Processing Using MATLAB", Third Edition Tata Mc Graw Hill Pvt. Ltd., 2011.

DIAGONIZING DISEASES BY RETINAL IMAGES USING IMAGE PROCESSING

A PROJECT REPORT

Submitted by

SURYA.V (Reg.no:311814106026)

VAJITHA PARVEEN.A (Reg.no:311814106029)

In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

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APRIL 2018

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BONAFIDE CERTIFICATE

Certified that this project report "**DIAGONISING DISEASES BY RETINAL IMAGES USING IMAGE PROCESSING**" is the bonafide work of "**V.SURYA (311814106026), A.VAJITHA PARVEEN (311814106029)**" who carried out the project work under my supervision.

18/4/18

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I.S. Suganthi 12/4/18

Mrs.I.S.SUGANTHI, M.E

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I.S. Suganthi 19/4/18

INTERNAL EXAMINER

EXTERNAL EXAMINER

19/4/18

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ABSTRACT

Digital image processing plays a vital role in medical field for detecting and identifying various diseases through digital processing techniques. Retinal images are used to diagnose various diseases like cardiovascular, diabetes, hypertension, stroke, tumors, etc.

Retinal blood vessels are difficult to detect, so segmentation of retinal blood vessels is important. In this paper we proposed a K-Means Clustering algorithm for retinal blood vessels segmentation and neural networks using DWT, GLCM as features for disease detection. The proposed algorithm was tested on mat lab versions. Thus, from this the disease is identified with various retinal images.

CHAPTER 5

CONCLUSION AND REFERENCES

5.1 CONCLUSION

The Paper proposed is used to identify and detect the accurate blood vessels and exudates from the retinal image. It helps to detect some major diseases like blood pressure, hypertension, cancer, tumors and cardio vascular disease. This can be easily performed by comparing the states of retinal blood vessels through GLCM features. Intrinsic characteristics of blood vessel make detection process difficult. Hence, we proposed an algorithm to detect the retinal blood vessels accurately.

Experimental result proves that the diseases can be effectively detected by applying NN classifier and K-means clustering for segmenting the affected parts in the retinal image. Here we detected the diseases like cancer, cardiac disease, high blood pressure, hypertension and tumor from retinal images effectively.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6001	Medical Electronics	Electro-Physiology and Bio-potential recording, EEG, Assist devices, Recent trends in medical instrumentation.

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EC6001 **MEDICAL ELECTRONICS** **L T P C**
3 0 0 3

OBJECTIVES:

- To gain knowledge about the various physiological parameters both electrical and non electrical and the methods of recording and also the method of transmitting these parameters.
- To study about the various assist devices used in the hospitals.
- To gain knowledge about equipment used for physical medicine and the various recently developed diagnostic and therapeutic techniques.

UNIT I ELECTRO-PHYSIOLOGY AND BIO-POTENTIAL RECORDING **9**

The origin of Bio-potentials; biopotential electrodes, biological amplifiers, ECG, EEG, EMG, PCG, lead systems and recording methods, typical waveforms and signal characteristics.

UNIT II BIO-CHEMICAL AND NON ELECTRICAL PARAMETER MEASUREMENT **9**

pH, PO_2, PCO_2, colorimeter, Auto analyzer, Blood flow meter, cardiac output, respiratory measurement, Blood pressure, temperature, pulse, Blood Cell Counters.

UNIT III ASSIST DEVICES **9**

Cardiac pacemakers, DC Defibrillator, Dialyser, Heart lung machine

UNIT IV PHYSICAL MEDICINE AND BIOTELEMETRY **9**

Diathermies- Shortwave, ultrasonic and microwave type and their applications, Surgical Diathermy Telemetry principles, frequency selection, biotelemetry, radiopill, electrical safety

UNIT V RECENT TRENDS IN MEDICAL INSTRUMENTATION **9**

Thermograph, endoscopy unit, Laser in medicine, cryogenic application, Introduction to telemedicine

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:

- Discuss the application of electronics in diagnostic and therapeutic area.
- Measure biochemical and various physiological information.
- Describe the working of units which will help to restore normal functioning.

TEXTBOOKS:

1. Leslie Cromwell, "Biomedical Instrumentation and Measurement", Prentice Hall of India, New Delhi, 2007.
2. John G.Webster, "Medical Instrumentation Application and Design", 3rd Edition, Wiley India Edition, 2007

REFERENCES:

1. Khandpur, R.S., "Handbook of Biomedical Instrumentation", TATA Mc Graw-Hill, New Delhi, 2003.
2. Joseph J.Carr and John M.Brown, "Introduction to Biomedical Equipment Technology", John Wiley and Sons, New York, 2004.

BRAIN TUMOUR SEGMENTATION BASED ON SFCM USING BACK PROPAGATION NEURAL NETWORK

A PROJECT REPORT

Submitted by

A.S.NAZMUNISHA **(Reg.no:311814106019)**

B.MAHERA **(Reg.no:311814106008)**

In partial fulfilment for the award of the degree

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BONAFIDE CERTIFICATE

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MOHAMED SATHAK A.J. COLLEGE OF ENGINEERING

Abstract

The project presents the MRI brain diagnosis support system for structure segmentation and its analysis using K-means clustering technique integrated with Fuzzy C-means algorithm. The method is proposed to segment normal tissues such as White Matter, Gray Matter, Cerebrospinal Fluid and abnormal tissue like tumour part from MR images automatically. These MR brain images are often corrupted with Intensity Inhomogeneity artifacts cause unwanted intensity variation due to non- uniformity in RF coils and noise due to thermal vibrations of electrons and ions and movement of objects during acquisition which may affect the performance of image processing techniques used for brain image analysis. Due to this type of artifacts and noises, sometimes one type of normal tissue in MRI may be misclassified as other type of normal tissue and it leads to error during diagnosis. The proposed method consists of pre-processing using Gaussian filter to remove noise and K-means clustering technique integrated with Fuzzy C-means algorithm segments normal tissues by considering spatial information because neighbouring pixels are highly correlated and also construct initial membership matrix randomly. The system also uses to segment the tumour cells along with this morphological filtering will be used to remove background noises for smoothening of region. The project results will be presented as segmented tissues and classification using neural network classifier.

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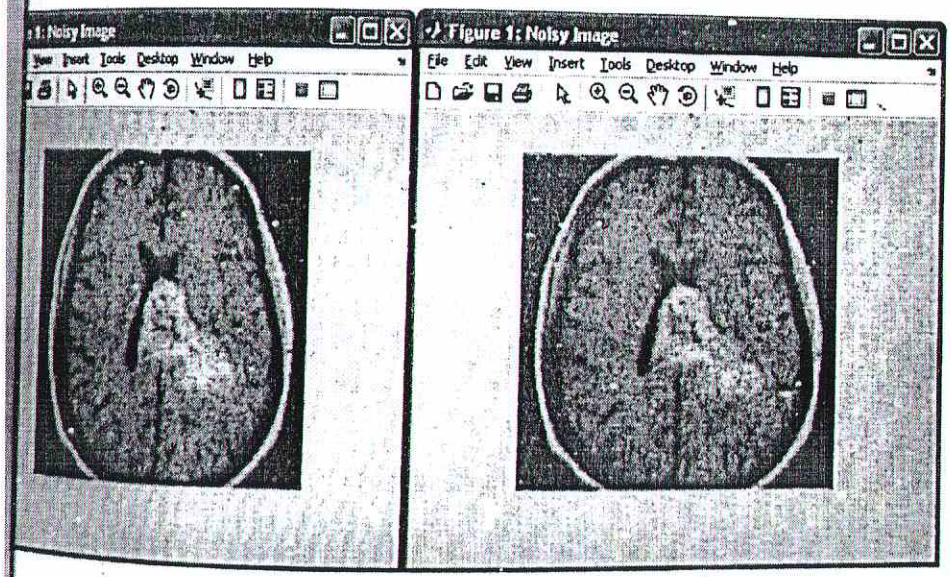
Figures are the windows that contain the GUI you design with the Layout Editor. See the description of figure properties for information on what figure characteristics you can control.

CHAPTER 5

SIMULATION RESULTS



PORTABLE HEART DISEASE DETECTOR

A PROJECT REPORT

Submitted by

A.DURGA **(Reg.no:311814106004)**

R.MEENA KUMARI **(Reg.no:311814106009)**

In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

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APRIL 2018

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Certified that this project report **"PORTABLE HEART DISEASE DETECTOR"** is the bonafide work of **"A.DURGA (311814106004), R.MEENA KUMARI (311814106009)"** who carried out the project work under my supervision.

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ABSTARCT

The word 'Health' has paved its way into the minds of the masses. Issues related to health are increasing at an alarming rate. Cardiovascular diseases, once considered to be a malady for the middle aged, are now prevalent among young adults. It is said that heart diseases kills 1 person every 33 seconds in India. The proposed model aims at detecting the occurrence of heart diseases by diagnosing the ECG signal. The chances of death due to heart diseases can be greatly reduced by enabling access to immediate medical attention. This paper mainly emphasizes on collection and inspection of ECG signal for determination of a heart diseases condition. Here, the survey on various behaviour's and conditions observed in the ECG during heart diseases would be discussed which is further processed and accordingly notified to the concerned individuals. The device aims to reduce the response time in case of occurrence of a heart disease which is crucial to prevent major damage to the distressed muscles in the heart.

7.2 CONCLUSIONS:

The proposed idea is implementable over a device for the several basic heart diseases conditions. The commercial Implementation is realistic with minimal changes in design and size of the model. It can not only aid the patient to keep track of his activities but also draw the attention of people in medical assistance as soon as risk level crosses the threshold.

However, unavailability of networks leads to failure in alerting ambulance and doctor. The heart diseases detection through ECG waveform is the screening test which further needs to be accompanied with factors like careful diagnoses of the ECG waveform to avoid misconception of heart diseases which are rare to occur, symptoms of heart attack, etc. and minute factors like age and gender of the person, high blood pressure, high blood cholesterol, overweight and obesity. The device in all acts as a powerful assistive diagnosis tool. In this paper, the conditions for analysis of heart diseases by analyzing the pulse waveform and the algorithm used to do the same were discussed in detail and the results obtained have been displayed accordingly.

7.3 FUTURESCOPE:

1. The proposed model can be made portable as it can be attached to accessories like wallets or mobile phone cases that are commonly used in daily lives.

2. The size of the device can be scaled down using VLSI to customize the components specifically for the intended purpose only there by making it lighter and more comfortable to be used as a portable device.

3. The device can be extended to make a heart monitoring system.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6701	RF and Microwave Engineering	Two port network theory, RF amplifiers and matching networks, microwave generation.

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EC6701 **RF AND MICROWAVE ENGINEERING** **L T P C**
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OBJECTIVES:

- To inculcate understanding of the basics required for circuit representation of RF networks.
- To deal with the issues in the design of microwave amplifier.
- To instill knowledge on the properties of various microwave components.
- To deal with the microwave generation and microwave measurement techniques

UNIT I TWO PORT NETWORK THEORY **9**

Review of Low frequency parameters: Impedance, Admittance, Hybrid and ABCD parameters, Different types of interconnection of Two port networks, High Frequency parameters, Formulation of S parameters, Properties of S parameters, Reciprocal and lossless Network, Transmission matrix, RF behavior of Resistors, Capacitors and Inductors.

UNIT II RF AMPLIFIERS AND MATCHING NETWORKS **9**

Characteristics of Amplifiers, Amplifier power relations, Stability considerations, Stabilization Methods, Noise Figure, Constant VSWR, Broadband, High power and Multistage Amplifiers, Impedancematching using discrete components, Two component matching Networks, Frequency response and quality factor, T and Pi Matching Networks, Microstrip Line Matching Networks.

UNIT III PASSIVE AND ACTIVE MICROWAVE DEVICES **9**

Terminations, Attenuators, Phase shifters, Directional couplers, Hybrid Junctions, Power dividers, Circulator, Isolator, Impedance matching devices: Tuning screw, Stub and quarter wave transformers. Crystal and Schottkey diode detector and mixers, PIN diode switch, Gunn diode oscillator, IMPATT diode oscillator and amplifier, Varactor diode, Introduction to MIC.

UNIT IV MICROWAVE GENERATION **9**

Review of conventional vacuum Triodes, Tetrodes and Pentodes, High frequency effects in vacuum Tubes, Theory and application of Two cavity Klystron Amplifier, Reflex Klystron oscillator, Traveling wave tube amplifier, Magnetron oscillator using Cylindrical, Linear, Coaxial Voltage tunable Magnetrons, Backward wave Crossed field amplifier and oscillator.

UNIT V MICROWAVE MEASUREMENTS **9**

Measuring Instruments : Principle of operation and application of VSWR meter, Power meter, Spectrum analyzer, Network analyzer, Measurement of Impedance, Frequency, Power, VSWR, Q- factor, Dielectric constant, Scattering coefficients, Attenuation, S-parameters.

OUTCOMES:

Upon completion of the course, students will be able to:

- Explain the active & passive microwave devices & components used in Microwave communication systems.
- Analyze the multi- port RF networks and RF transistor amplifiers.
- Generate Microwave signals and design microwave amplifiers.
- Measure and analyze Microwave signal and parameters.

TEXT BOOKS:

1. Reinhold Ludwig and Gene Bogdanov, "RF Circuit Design: Theory and Applications", Pearson Education Inc., 2011
2. Robert E Colin, "Foundations for Microwave Engineering", John Wiley & Sons Inc, 2005

REFERENCES:

1. David M. Pozar, "Microwave Engineering", Wiley India (P) Ltd, New Delhi, 2008

BONAFIDE CERTIFICATE

Certified that this project report "**L BAND MICROSTRIP ANTENNA FOR WEARABLE APPPLICATION**" is the bonafide work of "**N.M.JAVID MOHAMED (311814106007), J.MOHAMMED SAMEER ASHFAQ (311814106015), SAYYAD MAGDHUM (311814106023)**" who carried out the project work under my supervision.

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ABSTRACT

Design idea of wearable rectangular patch antenna and its array for MBAN (1.5 – 1.7 GHz) applications are proposed in this paper. Micro strip line with quarter wave transformer is used for feeding purpose. polyimide lossy (Nylon6) is used as dielectric substrate whereas the conductive parts i.e. patch and ground plane consists of nickel – copper – nickel coating on the textile substrate. The presence of highly conductive coating on substrate (i.e., surface resistance of 0.1 ohms/m2) aids in the reduction of losses. Five layer model consisting of bottom textile, air gap, skin, fat and bone is considered here. Since the wearable antennas are body worn devices effect of body curvature is also considered by conforming the antennas on cylindrical surface

Keyword: Medical application, L-Band micro strip antenna

RESULT AND CONCLUSION

This paper presents an antenna by using the (CST) computer simulation techonology. The antenna fulfilling the needs of spectrum scanning task can operate at 1.4GHz & 1.7GHz. The microstrip antenna for transmission can operate at (1.4GHz) and (1.7GHz).

A microstrip antenna offers many advantages such as easy fabrication and suitability for installation.

FUTURE WORK

- Improve the gain of the antenna.
- Integrate the antenna with even smaller design

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6504	Digital Signal Processing	IIR filter design, FIR filter design, Structures of FIR, Linear phase FIR filter, DSP applications.

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EC6502 **PRINCIPLES OF DIGITAL SIGNAL PROCESSING** L T P C

OBJECTIVES:

- To learn discrete Fourier transform and its properties
- To know the characteristics of IIR and FIR filters learn the design of infinite and finite impulse response filters for filtering undesired signals
- To understand Finite word length effects
- To study the concept of Multirate and adaptive filters

UNIT I DISCRETE FOURIER TRANSFORM 9

Discrete Signals and Systems- A Review – Introduction to DFT – Properties of DFT – Circular Convolution - Filtering methods based on DFT - FFT Algorithms -Decimation in time Algorithms, Decimation in frequency Algorithms - Use of FFT in Linear Filtering.

UNIT II IIR FILTER DESIGN 9

Structures of IIR - Analog filter design - Discrete time IIR filter from analog filter - IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives - (LPF, HPF, BPF, BRF) filter design using frequency translation.

UNIT III FIR FILTER DESIGN 9

Structures of FIR - Linear phase FIR filter - Fourier Series - Filter design using windowing techniques (Rectangular Window, Hamming Window, Hanning Window), Frequency sampling techniques - Finite word length effects in digital Filters: Errors, Limit Cycle, Noise Power Spectrum.

UNIT IV FINITE WORDLENGTH EFFECTS 9

Fixed point and floating point number representations - ADC -Quantization- Truncation and Rounding errors - Quantization noise - coefficient quantization error - Product quantization error - Overflow error - Roundoff noise power - limit cycle oscillations due to product round off and overflow errors - Principle of scaling

UNITV DSP APPLICATIONS 9

Multirate signal processing: Decimation, Interpolation, Sampling rate conversion by a rational factor - Adaptive Filters: Introduction, Applications of adaptive filtering to equalization.

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to

- apply DFT for the analysis of digital signals & systems
- design IIR and FIR filters
- characterize finite Word length effect on filters
- design the Multirate Filters
- apply Adaptive Filters to equalization

TEXT BOOK:

1. John G. Proakis & Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", Fourth Edition, Pearson Education / Prentice Hall, 2007.

REFERENCES:

1. Emmanuel C..Ifeachor, & Barrie.W.Jervis, "Digital Signal Processing", Second Edition, Pearson Education / Prentice Hall, 2002.
2. Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach", Tata Mc Graw Hill, 2007.
3. A.V.Oppenheim, R.W. Schafer and J.R. Buck, "Discrete-Time Signal Processing", 8th Indian Reprint, Pearson, 2004.
4. Andreas Antoniou, "Digital Signal Processing", Tata Mc Graw Hill, 2006.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6303	Signal and Systems	Classifications of signals and systems, linear time in variant-continuous time systems, baseband sampling, DTFT properties

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EC6303	SIGNALS AND SYSTEMS	L T P C 3 1 0 4

OBJECTIVES:

- To understand the basic properties of signal & systems and the various methods of classification
- To learn Laplace Transform &Fourier transform and their properties
- To know Z transform & DTFT and their properties
- To characterize LTI systems in the Time domain and various Transform domains

UNIT I CLASSIFICATION OF SIGNALS AND SYSTEMS 9

Continuous time signals (CT signals) - Discrete time signals (DT signals) - Step, Ramp, Pulse,Impulse, Sinusoidal, Exponential, Classification of CT and DT signals - Periodic & Aperiodic signals, Deterministic & Random signals, Energy & Power signals - CT systems and DT systems- Classification of systems – Static & Dynamic, Linear & Nonlinear, Time-variant & Time-invariant, Causal & Noncausal, Stable & Unstable.

UNIT II ANALYSIS OF CONTINUOUS TIME SIGNALS 9

Fourier series analysis-spectrum of Continuous Time (CT) signals- Fourier and Laplace Transforms in CT Signal Analysis - Properties.

UNIT III LINEAR TIME INVARIANT- CONTINUOUS TIME SYSTEMS 9

Differential Equation-Block diagram representation-impulse response, convolution integrals-Fourier and Laplace transforms in Analysis of CT systems

UNIT IV ANALYSIS OF DISCRETE TIME SIGNALS 9

Baseband Sampling - DTFT - Properties of DTFT - Z Transform - Properties of Z Transform

UNIT V LINEAR TIME INVARIANT-DISCRETE TIME SYSTEMS 9

Difference Equations-Block diagram representation-Impulse response - Convolution sum- Discrete Fourier and Z Transform Analysis of Recursive & Non-Recursive systems

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:

Upon the completion of the course, students will be able to:

- Analyze the properties of signals & systems
- Apply Laplace transform, Fourier transform, Z transform and DTFT in signal analysis
- Analyze continuous time LTI systems using Fourier and Laplace Transforms
- Analyze discrete time LTI systems using Z transform and DTFT

TEXT BOOK:

1. Allan V.Oppenheim, S.Wilsky and S.H.Nawab, "Signals and Systems", Pearson, 2007.

REFERENCES:

1. B. P. Lathi, "Principles of Linear Systems and Signals", Second Edition, Oxford, 2009.
2. R.E.Zeimer, W.H.Tranter and R.D.Fannin, "Signals & Systems - Continuous and Discrete", Pearson, 2007.
3. John Alan Stuller, "An Introduction to Signals and Systems", Thomson, 2007.
4. M.J.Roberts, "Signals & Systems Analysis using Transform Methods & MATLAB", Tata McGraw Hill, 2007.

HARDWARE EFFICIENT FIR FILTER STRUCTURES FOR SYMMETRIC CONVOLUTIONS BASED ON FFA USING CSE METHOD

A PROJECT REPORT

Submitted by

J. Prasanth **(Reg.no:311814106502)**

In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

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APRIL 2018

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BONAFIDE CERTIFICATE

Certified that this project report "**HARDWARE EFFICIENT FIR FILTER STRUCTURES FOR SYMMETRIC CONVOLUTIONS BASED ON FFA USING CSE METHOD**" is the bonafide work of **"J.Prasanth" (311814106502),** who carried out the project work under my supervision.

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Submitted for viva-voice examination held on 19-04-18

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ABSTRACT

Due to the explosive growth of multimedia applications, the demand for high-performance and low-power digital signal processing (DSP) is getting higher and higher. Finite Impulse Response (FIR) digital filters are one of the most widely used fundamental devices performed in DSP systems.

Based on Fast Finite Impulse Response (FIR) Algorithms (FFAs), a new parallel FIR filter structures, which are beneficial to symmetric coefficients in terms of hardware cost, under the condition that the number of taps is a multiple of 2 or 3 is designed. The proposed parallel FIR structures exploit the inherent nature of symmetric coefficients reducing half the number of multipliers in sub filter section at the expense of additional adders in pre-processing and post-processing blocks. Although the number of multipliers is reduced, the number of adders required to implement the Multiple Constant Multiplication (MCM) blocks is still high. So the Common Subexpression Elimination (CSE) method is used in these new FFA structures to minimize the number of additions by extracting the common parts among the constructs represented in CSD form. Overall, the proposed parallel FIR structures using CSE method can lead to significant hardware savings for symmetric convolutions from the existing FFA parallel FIR filter, especially when the length of the filter is large.

CHAPTER 6

CONCLUSION

The new FFA based parallel FIR filter structures using CSE method, which saves a significant amount of adders required to implement the MCM blocks of subfilter section is designed. The proposed new structure also exploits the inherent nature of symmetric coefficients under the condition that the number of taps is a multiple of 2 or 3 reducing half the number of multipliers in subfilter section at the expense of additional adders. Since multipliers outweigh adders in hardware cost, it is profitable to exchange multipliers with adders. Moreover, the number of increased adders stays still when the length of FIR filter becomes large, whereas the number of reduced multipliers increases along with the length of FIR filter. Consequently, the larger the length of FIR filters is, the more the proposed structures can save from the existing FFA structures, with respect to the hardware cost. Overall, in this work, we have provided new parallel FIR structures using CSE method consisting of advantageous polyphase decompositions dealing with symmetric convolutions comparatively better than the existing FFA structures in terms of hardware consumption.

6.1 FUTURE WORK

In future work, the efficient parallel FIR filter structures based on FFA can be implemented with any other signed digit representation that best reduces the complexity of FIR filter structures. Then these efficient FIR filter structures can be used for Digital Signal Processing Applications.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6703	Embedded and Real time Systems	Introduction to embedded computing, embedded computing, processes.

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EC6703 **EMBEDDED AND REAL TIME SYSTEMS** **L T P C**
3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn the architecture and programming of ARM processor.
- Be familiar with the embedded computing platform design and analysis.
- Be exposed to the basic concepts of real time Operating system.
- Learn the system design techniques and networks for embedded systems

UNIT I INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS **9**

Complex systems and micro processors- Embedded system design process -Design example: Model train controller- Instruction sets preliminaries - ARM Processor - CPU: programming input and output-supervisor mode, exceptions and traps – Co-processors- Memory system mechanisms – CPU performance- CPU power consumption.

UNIT II EMBEDDED COMPUTING PLATFORM DESIGN **9**

The CPU Bus-Memory devices and systems-Designing with computing platforms - consumer electronics architecture - platform-level performance analysis - Components for embedded programs-Models of programs- Assembly, linking and loading - compilation techniques- Program level performance analysis - Software performance optimization - Program level energy and power analysis and optimization - Analysis and optimization of program size- Program validation and testing.

UNIT III PROCESSES AND OPERATING SYSTEMS **9**

Introduction - Multiple tasks and multiple processes - Multirate systems- Preemptive real-time operating systems- Priority based scheduling- Interprocess communication mechanisms - Evaluating operating system performance- power optimization strategies for processes - Example Real time operating systems-POSIX-Windows CE.

UNIT V SYSTEM DESIGN TECHNIQUES AND NETWORKS **9**

Design methodologies- Design flows - Requirement Analysis - Specifications-System analysis and architecture design - Quality Assurance techniques- Distributed embedded systems - MPSoCs and shared memory multiprocessors.

UNIT V CASE STUDY **9**

Data compressor - Alarm Clock - Audio player - Software modem-Digital still camera - Telephone answering machine-Engine control unit – Video accelerator.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:

- Describe the architecture and programming of ARM processor.
- Outline the concepts of embedded systems
- Explain the basic concepts of real time Operating system design.
- Use the system design techniques to develop software for embedded systems
- Differentiate between the general purpose operating system and the real time operating system
- Model real-time applications using embedded-system concepts

TEXT BOOK:

1. Marilyn Wolf, "Computers as Components - Principles of Embedded Computing System Design", Third Edition "Morgan Kaufmann Publisher (An imprint from Elsevier), 2012.

REFERENCES:

1. Jonathan W.Valvano, "Embedded Microcomputer Systems Real Time Interfacing", Third Edition Cengage Learning, 2012.
2. David. E. Simon, "An Embedded Software Primer", 1st Edition, Fifth Impression, Addison-Wesley Professional, 2007.
3. Raymond J.A. Buhr, Donald L.Bailey, "An Introduction to Real-Time Systems- From Design to Networking with C/C++", Prentice Hall, 1999.
4. C.M. Krishna, Kang G. Shin, "Real-Time Systems", International Editions, Mc Graw Hill 1997
5. K.V.K.K.Prasad, "Embedded Real-Time Systems: Concepts, Design & Programming", Dream Tech Press, 2005.
6. Sriram V Iyer, Pankaj Gupta, "Embedded Real Time Systems Programming", Tata Mc Graw Hill, 2004.

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SPEED CONTROL OF ROAD VEHICLES USING INTERNET OF THINGS (IOT)

A PROJECT REPORT

Submitted by

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K.M.PREETHA **(Reg.no:311814106020)**

In partial fulfilment for the award of the degree

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ABSTRACT

In our daily life, enhancement in work leads to travelling, travelling turns in lead to face traffic, which makes us to increase our speed and ends with an accident in some circumstances. This work helps the people to reduce speed, inorder to avoid accidents. This activity helps to ensure the safety of the people to free from accidents and been applied to many zones like schools, hospitals, dangerous zones etc. This paper aims at automatically controlling the speed of vehicles at speed restricted areas such as schools, hospitals and dangerous curves and accident zones etc. Nowadays , the drivers drives the vehicles at very high speed and traffic police are not able to control and monitor them throughout. In this project, these road vehicles are controlled automatically using Internet Of Things (IOT)

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CHAPTER 8

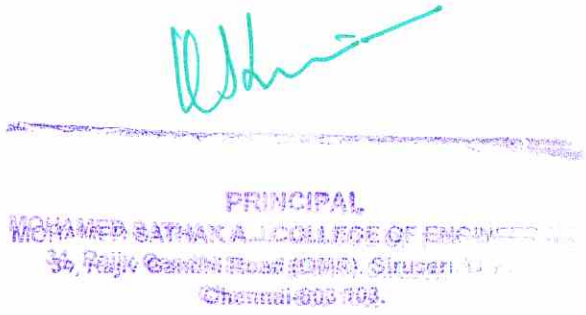
RESULT AND CONCLUSION

8.1. RESULT

The values of GPS module and speed sensor are given to the cloud and it displays the real time value of speed sensor in the form of graph. The graph is obtained in the channels in which it is already created.

8.2. CONCLUSION

In recent years, the Internet of Things has developed very rapidly and has become a development trend to improve living conditions in the world as a whole. The Internet Of Things applied to the monitoring the speed of the vehicles will play an important roles in the management of accidents of urban and rural transports in the cities of the future.



FOOD ANALYSIS USING EMBEDDED AND IOT

A PROJECT REPORT

Submitted by

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In partial fulfilment for the award of the degree

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in

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ABSTRACT

Food is one of the major factor for the existence of all living organisms. A day without food and water cannot be imagined by us. Each day we are consuming variety of foods and beverages but we people are least bothered about its freshness and quality. To avoid such an issue, we are proposing the concept of food analysis. In this proposed system we are going to determine the freshness and quality of food by analysing factors like temperature, humidity and gases released using sensors. Based on this analysis we are going to determine whether the respective food is edible or not. Here we have chosen mainly three categories of food like packed chicken, packed sweet and packed malt drinks. These proposed systems can be installed in small scale and large-scale industries and as a future enhancement this concept can be implemented as a portable food analysis device which can be designed at a very low cost.

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CHAPTER 6

CONCLUSION

In recent years, the Internet of Things has developed very rapidly and has become a developing trend to improve living conditions in the world as a whole. The Internet of Things applied to the food analysis will help the consumers to check whether the respective food is edible or not. At the early years the food analysis was performed in laboratories using chemicals. But this proposed method can be installed in large scale and small-scale industries to analyse the raw materials used during the time of manufacturing and also by using this method we can perform the analysis of food from anywhere at any time at a very low cost. Based on the analysis of our food samples the following are the outcome that has obtained.

The temperature and humidity factors play a major role in the food analysis. Since the temperature may not be constant always, we are performing the food analysis at fixed range from 22*c-37*c and the humidity value occurred at this range of temperature is taken into consideration.

For a packed chicken the humidity value ranges from78%-84% Temperature value ranges from27*c-37*c, methane gas ranges from 267ppm-301ppm and moisture content ranges from 329m3-359m3

For a packed sweet the humidity value ranges from52%-59% Temperature value ranges from27*c-37*c, methane gas ranges from 108ppm-190ppm and moisture content ranges from 20m3-30m3

For a packed milk product, the humidity value ranges from94%-96% Temperature value ranges from27*c-37*c, methane gas ranges from 192ppm-267ppm and moisture content ranges from 337m3-508m3

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6405	Control System Engineering	Control system modeling, time response analysis.

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EC6405 **CONTROL SYSTEM ENGINEERING** **L T P C**
3 0 0 3

OBJECTIVES:

- To introduce the elements of control system and their modeling using various Techniques.
- To introduce methods for analyzing the time response, the frequency response and the stability of systems
- To introduce the state variable analysis method

UNIT I CONTROL SYSTEM MODELING **9**

Basic Elements of Control System – Open loop and Closed loop systems - Differential equation - Transfer function, Modeling of Electric systems, Translational and rotational mechanical systems - Block diagram reduction Techniques - Signal flow graph

UNIT II TIME RESPONSE ANALYSIS **9**

Time response analysis - First Order Systems - Impulse and Step Response analysis of second order systems - Steady state errors - P, PI, PD and PID Compensation, Analysis using MATLAB

UNIT III FREQUENCY RESPONSE ANALYSIS **9**

Frequency Response - Bode Plot, Polar Plot, Nyquist Plot - Frequency Domain specifications from the plots - Constant M and N Circles - Nichol"s Chart - Use of Nichol"s Chart in Control System Analysis. Series, Parallel, series-parallel Compensators - Lead, Lag, and Lead Lag Compensators, Analysis using MATLAB.

UNIT IV STABILITY ANALYSIS **9**

Stability, Routh-Hurwitz Criterion, Root Locus Technique, Construction of Root Locus, Stability, Dominant Poles, Application of Root Locus Diagram - Nyquist Stability Criterion - Relative Stability, Analysis using MATLAB

UNIT V STATE VARIABLE ANALYSIS **9**

State space representation of Continuous Time systems - State equations - Transfer function from State Variable Representation - Solutions of the state equations - Concepts of Controllability and Observability - State space representation for Discrete time systems. Sampled Data control systems – Sampling Theorem - Sampler & Hold - Open loop & Closed loop sampled data systems.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:

- Perform time domain and frequency domain analysis of control systems required for stability analysis.
- Design the compensation technique that can be used to stabilize control systems.

TEXTBOOK:

1. J.Nagrath and M.Gopal, "Control System Engineering", New Age International Publishers, 5th Edition, 2007.

REFERENCES:

1. Benjamin.C.Kuo, "Automatic control systems", Prentice Hall of India, 7th Edition,1995.
2. M.Gopal, "Control System - Principles and Design", Tata McGraw Hill, 2nd Edition, 2002.
3. Schaum"s Outline Series, "Feed back and Control Systems" Tata Mc Graw-Hill, 2007.
4. John J.D"Azzo & Constantine H.Houpis, "Linear Control System Analysis and Design"", Tata Mc Graw-Hill, Inc., 1995.

A SMART INDUSTRIAL AUTOMATION AND MONITORING SYSTEM BASED ON GLOBAL MESSAGING AND POSITION SYSTEM

A PROJECT REPORT

Submitted by

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In partial fulfillment for the award of the degree

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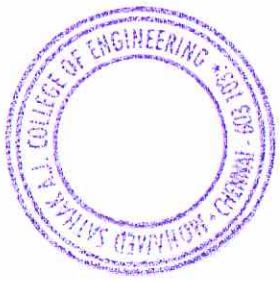
ABSTRACT

Smart grid as the basis for describing, discussing, and developing the final architecture of the smart grid. The survey of communication architectures, including the communication compositions, technologies, requirements etc. are provided. Different communications technologies supported by two main communication media, wired and wireless, should be used for data transmission between digital devices and electric utilities, or their Centre's.



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CHAPTER 9

CONCLUSION

A wireless smart sensor platform targeted for instrumentation systems and predictive maintenance was presented. Sample implementations for instrumentation systems and predictive maintenance applications were discussed and presented. Tests were carried out to determine system performance and were presented. The experimental results show that a sustained near-real-time system can be set up with the smart sensor nodes.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6801	Wireless Communication	Wireless channels, Cellular Architecture.

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EC6801 **WIRELESS COMMUNICATION** **L T P C**

3 0 0 3

OBJECTIVES:

The student should be made to:

- Know the characteristic of wireless channel
- Learn the various cellular architectures
- Understand the concepts behind various digital signaling schemes for fading channels
- Be familiar the various multipath mitigation techniques
- Understand the various multiple antenna systems

UNIT I WIRELESS CHANNELS **9**

Large scale path loss - Path loss models: Free Space and Two-Ray models -Link Budget design - Small scale fading- Parameters of mobile multipath channels - Time dispersion parameters- Coherence bandwidth - Doppler spread & Coherence time, Fading due to Multipath time delay spread - flat fading - frequency selective fading - Fading due to Doppler spread - fast fading - slow fading.

UNIT II CELLULAR ARCHITECTURE **9**

Multiple Access techniques - FDMA, TDMA, CDMA - Capacity calculations-Cellular concept- Frequency reuse - channel assignment- hand off- interference & system capacity- trunking & grade of service – Coverage and capacity improvement.

UNIT III DIGITAL SIGNALING FOR FADING CHANNELS **9**

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle – Cyclic prefix, Windowing, PAPR.

UNIT IV MULTIPATH MITIGATION TECHNIQUES **9**

Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity - Micro and Macrodiversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver,

UNIT V MULTIPLE ANTENNA TECHNIQUES **9**

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming - transmitter diversity, receiver diversity- Channel state information-capacity in fading and non-fading channels

OUTCOMES:

At the end of the course, the student should be able to:

- Characterize wireless channels
- Design and implement various signaling schemes for fading channels
- Design a cellular system
- Compare multipath mitigation techniques and analyze their performance
- Design and implement systems with transmit/receive diversity and MIMO systems and analyze their performance

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TEXTBOOKS:

1. Rappaport,T.S., "Wireless communications", Second Edition, Pearson Education, 2010.
2. Andreas.F. Molisch, "Wireless Communications", John Wiley - India, 2006.

REFERENCES:

1. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication",

ELECTRO SPY

A PROJECT REPORT

Submitted by

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S.SAJID ALI **(Reg.no:311814106022)**

In partial fulfilment for the award of the degree

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EXTERNAL EXAMINER

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ABSTRACT

Nowadays, providing a security system for houses has become a vital research in which the latest technologies are being adopted to serve this purpose.

Wireless network is one of the technologies that have been used to provide remote monitor and control for the home appliances.

This paper aims to propose a surveillance camera based on Raspberry pi technology where cameras, Raspberry pi3 board and Thing speak application are being utilized to provide an alarming system that has the ability to notify the owner.

The system works by taking snaps for the person through a code and USB camera positioned in somewhere then, such snaps will compared with library files, If there any unauthorized persons entered the snap will be sent to the owner.

The proposed system can be extended to be used for different properties and facilities such as banks and office.

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8.2 CONCLUSION:

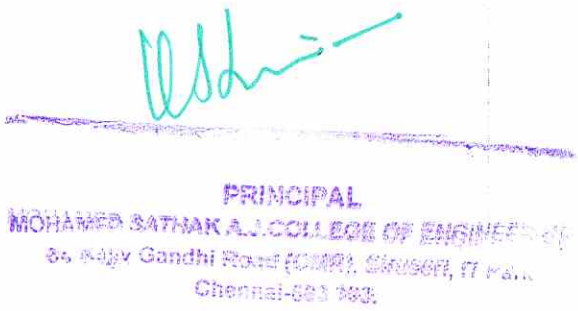
The project designed and implemented a security system based on the Raspberry Pi. The aspects of the system are: video capturing using a USB Camera analyzing the captured images using Haar cascade algorithm, If the image is unauthorized means sends an alert to the Mobile phone . Here we are using thingspeak application for get alert.

8.3 FUTURE SCOPE

The following are recommended:

➢ The designed security system can be used in homes to monitor the facility at any given time.

➢ The system requires to be remotely controlled. Hence, future explorations should focus much more on the same.



MULTI-BAND CIRCULARLY POLARIZED ANTENNA FOR WLAN/WI-MAX APPLICATION

A PROJECT REPORT

Submitted by

ASARUDEEN.K.P **(Reg.no:311814106002)**

MOHAMED AZARUDEEN.M **(Reg.no:311814106012)**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

MOHAMED SATHAK A J COLLEGE OF ENGINEERING

EGATTUR, CHENNAI-603103

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ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2018

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report "**MULTIBAND CIRCULARLY POLARIZED ANTENNA FOR WLAN/WI-MAX APPLICATION**" is the bonafide work of **"ASARUDEEN.K.P (311814106002), MOHAMED AZARUDEEN.M (311814106012)"**who carried out the project work under my supervision.

18/4/18

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Submitted for viva-voice examination held on..19/4/18.....at Mohammed Sathak A.J College of engineering, Chennai-603 103

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19/4/18

INTERNAL EXAMINER

19/4/18

EXTERNAL EXAMINER

ABSTRACT

The main aim is to focus on the design of multiband antenna intended for existing wireless services including GPS, GSM, PCS, DCS, GPS, UMTS, bands. The present techniques available in the open literature include the modification of the main radiator via bending, folding, meandering and wrapping. Each approach offers different advantages, depending on the required application. The introduction of a ground slot in a finite antenna ground plane can be further extended to include reconfigurable features. Thus, such antennas that are compact and have multiband capability can be promising candidates for many wireless applications. Now in this slotted multi band planar system is proposed to intend on working on for frequency bands such as IN GPS, WLAN (over two frequency band spectrum) and Wi -MAX.

CHAPTER 5

RESULT AND DISCUSSION

5.1 SIMULATION RESULTS

The software used to model and simulate the microstrip patch antenna in CST is a high performance full wave electromagnetic (EM) field simulator for arbitrary 3D volumetric passive device modelling that takes advantages of the familiar micro soft graphical user interface.

CST can be used to calculate parameters such as S-parameters, resonant frequency and Fields. CST is a full-wave electromagnetic simulator based on the method of moments. It analyzes 3D and multilayer structures of general shapes. An soft pioneered the use of the Finite Element Method(FEM) for EM simulation by developing or implementing technologies such as tangential vector finite elements, adaptive meshing and Adaptive LancozosPade Sweep(ALPS).

It has been widely used in the design of RFICs, patch antennas, wire antennas and other RF or wireless antennas. It has been used to calculate and plot the S11 parameters, VSWR, current distributions as well as the radiation pattern.

Ch P T Item Code No. C 81804355
500 Pads. Dt. 22-6-2017

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CHENNAI PORT TRUST

Date 19.05.2018

No. MEE/HA2/MISC./2017/Dy.CME(W)

Certificate No 0109

VOCATIONAL INPLANT TRAINING CERTIFICATE

This is to certify that Shri/Selvi. K. JAYAKANTH Student of MOHAMED SATHAK A.J. COLLEGE OF ENGINEERING, SIRUSERI, CHENNAI. has undergone INPLANT TRAINING as non-stipendiary vocational trainee for a period from 15.05.2018 to 19.05.2018 in the Electrical / Mechanical / Electronics division of Mechanical and Electrical Engineering Department in Chennai Port Trust.

During the period of training his / her attendance, work and conduct were found good.

19/5/18

(C. MAHENDIRAN)
Principal (Basic Training)
for CHIEF MECHANICAL ENGINEER

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SiruseriIT Park, Egattur, Chennai - 603 103

S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6504	Microprocessor and Micro Controller	I/O interfacing, Microcontroller, interfacing microcontroller.

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EC6504 **MICROPROCESSOR AND MICROCONTROLLER** **L T P C**
3 0 0 3

OBJECTIVES:

The student should be made to:

- Study the Architecture of 8086 microprocessor.
- Learn the design aspects of I/O and Memory Interfacing circuits.
- Study about communication and bus interfacing.
- Study the Architecture of 8051 microcontroller.

UNIT I THE 8086 MICROPROCESSOR **9**

Introduction to 8086 – Microprocessor architecture – Addressing modes - Instruction set and assembler directives – Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros – Interrupts and interrupt service routines – Byte and String Manipulation.

UNIT II 8086 SYSTEM BUS STRUCTURE **9**

8086 signals – Basic configurations – System bus timing –System design using 8086 – IO programming – Introduction to Multiprogramming – System Bus Structure - Multiprocessor configurations – Coprocessor, Closely coupled and loosely Coupled configurations – Introduction to advanced processors.

UNIT III I/O INTERFACING **9**

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – D/A and A/D Interface - Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications Case studies: Traffic Light control, LED display , LCD display, Keyboard display interface and Alarm Controller.

UNIT IV MICROCONTROLLER **9**

Architecture of 8051 – Special Function Registers(SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

UNIT V INTERFACING MICROCONTROLLER **9**

Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation.

OUTCOMES:

At the end of the course, the student should be able to:

- Design and implement programs on 8086 microprocessor.
- Design I/O circuits.
- Design Memory Interfacing circuits.
- Design and implement 8051 microcontroller based systems.

TEXT BOOKS:

3. Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2007.
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson education, 2011.

REFERENCE:

2. Doughlas V.Hall, "Microprocessors and Interfacing, Programming and Hardware",TMH,2012

RASPBERRY-PI BASED ON SECURED TRANSACTION SYSTEM

A PROJECT REPORT

Submitted by

S.K.FAZILATHUNNISSA **(Reg.no:311814106005)**

I.SHABIYA **(Reg.no:311814106024)**

In partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

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APRIL 2018

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BONAFIDE CERTIFICATE

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Mrs.Dr.E.DHIRAVIDACHELVI,Ph.D	**Ms.M.REKHA,M.E**
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INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Automated teller machines (ATMs) are well known devices typically used by individuals to carry out a variety of personal and business financial transactions and/or banking functions. ATMs have become very popular with the general public for their availability and general user friendliness. ATMs are now found in many locations having a regular or high volume of consumer traffic. For example, ATMs are typically found in restaurants, supermarkets, Convenience stores, malls, schools, gas stations, hotels, work locations, banking centers, airports, entertainment establishments, transportation facilities and a myriad of other locations. ATMs are typically available to consumers on a continuous basis such that consumers have the ability to carry out their ATM financial transactions and/or banking functions at any time of the day and on any day of the week. This based on the facial recognition and also the multilevel security system based to work this entire concept. Here, we have some face recognition system is used to itendify the person if he or she is a user or third user.New generation ATM machine which can be operated without the ATM card. In this system we have some more webpages for the identification of the user and 3 rd user. In first webpage we have two buttons one for user and another one for third user, if I am user means I want to click user button or otherwise click third user button. If I am a user means the amount webpage is automatically open. Else, it should be automatically terminated. Maybe I am third user first I want to enter the authorized user name and password then camera take image mail to authorized person at the same time send alert SMS via IOT. Here every control is in user hand. There is one another webpage also included for emergency purpose.

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16.2 CONCLUSION:

Nowadays, most of the ATM has been attacked by the robberies. In this paper, a real-time monitoring system for ATM security based on accelerometer sensor, camera module, and fingerprint module is proposed. The proposed work concludes with the following points:

- a secure way of accessing an ATM by authorized persons using face recognition module.
- eliminates the drawback of previous system like manual controlling camera modules and doors.
- the system is cost effective as compare to existing manual technique.
- the real time video of the ATM centre can be monitored through web server which make ATM better safe from thefts.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6201	Electronics Devices	Semi conductor diode, special semi devices, power devices and display devices.

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EC6201 **ELECTRONIC DEVICES** **L T P C**
3 0 0 3

OBJECTIVES:

The student should be made to:

- Be exposed to basic electronic devices
- Be familiar with the theory, construction, and operation of Basic electronic devices.

UNIT I SEMICONDUCTOR DIODE 9

PN junction diode, Current equations, Diffusion and drift current densities, forward and reverse bias characteristics, Switching Characteristics.

UNIT II BIPOLAR JUNCTION9

NPN -PNP -Junctions-Early effect-Current equations – Input and Output characteristics of CE, CB CC-Hybrid -π model - h-parameter model, Ebers Moll Model- Gummel Poon-model, Multi Emitter Transistor.

UNIT III FIELD EFFECT TRANSISTORS 9

JFETs - Drain and Transfer characteristics,-Current equations-Pinch off voltage and its significance-MOSFET- Characteristics- Threshold voltage -Channel length modulation, D-MOSFET, E-MOSFET-,Current equation - Equivalent circuit model and its parameters, FINFET,DUAL GATE MOSFET.

UNIT IV SPECIAL SEMICONDUCTOR DEVICES 9

Metal-Semiconductor Junction- MESFET, Schottky barrier diode-Zener diode-Varactor diode -Tunnel diode- Gallium Arsenide device, LASER diode, LDR.

UNIT V POWER DEVICES AND DISPLAY DEVICES 9

UJT, SCR, Diac, Triac, Power BJT- Power MOSFET- DMOS-VMOS. LED, LCD, Photo transistor, Opto Coupler, Solar cell, CCD.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Explain the theory, construction, and operation of basic electronic devices.
- Use the basic electronic devices

TEXT BOOKS

1. Donald A Neaman, "Semiconductor Physics and Devices", Third Edition, Tata Mc GrawHill Inc. 2007.

REFERENCES:

1. Yang, "Fundamentals of Semiconductor devices", McGraw Hill International Edition, 1978.
2. Robert Boylestad and Louis Nashelsky, "Electron Devices and Circuit Theory" Pearson Prentice Hall, 10th edition,July 2008.

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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6601	VLSI Design	Implementation strategies.

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EC6601 **VLSI DESIGN** **L T P C**
3 0 0 3

OBJECTIVES:

- In this course, the MOS circuit realization of the various building blocks that is common to any microprocessor or digital VLSI circuit is studied.
- Architectural choices and performance tradeoffs involved in designing and realizing the circuitsin CMOS technology are discussed.
- The main focus in this course is on the transistor circuit level design and realization for digital operation and the issues involved as well as the topics covered are quite distinct from those encountered in courses on CMOS Analog IC design.

UNIT I MOS TRANSISTOR PRINCIPLE **9**

NMOS and PMOS transistors, Process parameters for MOS and CMOS, Electrical properties of CMOS circuits and device modeling, Scaling principles and fundamental limits, CMOS inverter scaling, propagation delays, Stick diagram, Layout diagrams

UNIT II COMBINATIONAL LOGIC CIRCUITS **9**

Examples of Combinational Logic Design, Elmore"s constant, Pass transistor Logic, Transmission gates, static and dynamic CMOS design, Power dissipation – Low power design principles

UNIT III SEQUENTIAL LOGIC CIRCUITS **9**

Static and Dynamic Latches and Registers, Timing issues, pipelines, clock strategies, Memory architecture and memory control circuits, Low power memory circuits, Synchronous and Asynchronous design

UNIT IV DESIGNING ARITHMETIC BUILDING BLOCKS **9**

Data path circuits, Architectures for ripple carry adders, carry look ahead adders, High speed adders, accumulators, Multipliers, dividers, Barrel shifters, speed and area tradeoff

UNIT V IMPLEMENTATION STRATEGIES **9**

Full custom and Semi custom design, Standard cell design and cell libraries, FPGA building block architectures, FPGA interconnect routing procedures.

OUTCOMES:

Upon completion of the course, students should

- Explain the basic CMOS circuits and the CMOS process technology.
- Discuss the techniques of chip design using programmable devices.
- Model the digital system using Hardware Description Language.

TEXTBOOKS:

1. Jan Rabaey, Anantha Chandrakasan, B.Nikolic, "Digital Integrated Circuits: A Design Perspective", Second Edition, Prentice Hall of India, 2003.
2. M.J. Smith, "Application Specific Integrated Circuits", Addisson Wesley, 1997

REFERENCES:

1. N.Weste, K.Eshraghian, "Principles of CMOS VLSI Design", Second Edition, Addision Wesley 1993
2. R.Jacob Baker, Harry W.LI., David E.Boyee, "CMOS Circuit Design, Layout and Simulation" Prentice Hall of India 2005
3. A.Pucknell, Kamran Eshraghian, "BASIC VLSI Design", Third Edition, Prentice Hall of India, 2007.

TOTAL: 45 PERIODS

ELECTRONIC GUARDS FOR AGRI LANDS

A PROJECT REPORT

Submitted by

D.MOHAN RAJ **(Reg.no:311814106016)**

M.SYEDAFZAL **(Reg.no:311814106027)**

In partial fulfilment for the award of the degree

Of

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Certified that this project report **"ELECTRONIC GUARDS FOR AGRI LANDS"** is the bonafide work of **"D.MOHAN RAJ (311814106016), M.SYEDAFZAL (311814106027)"** who carried out the project work under my supervision.

15/4/18

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INTERNAL EXAMINER

19/4/18

EXTERNAL EXAMINER

19/4/18

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ABSTRACT

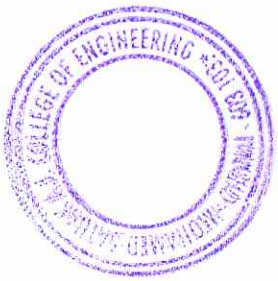
We came up with a good idea for solving a real time problem where all the rural people face this every day. Our project which helps us to balance the environment lifecycle properly. As we hear that animals like elephants and so on which damage the fields and even it kills the people are threating one.so even people took several ways to solve but it landed in failure. So which gave us a good and challenging task to solve this problem and help those people. Not only helping those people is not our intention even we are planning to save animals also.

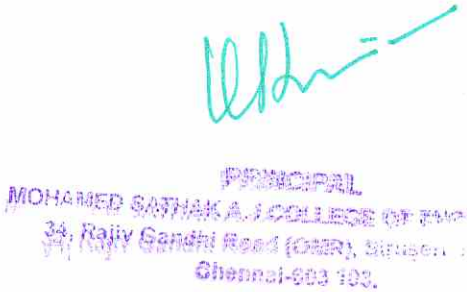
6.2CONCLUSION:

Portable and easy to use. By implementing this idea human power and time will be saved. Major injuries and damages are avoided. No 24/7 monitoring is required. Animal and human intraction will be reduced. Damages to agri lands will be reduced.

6.3FUTURE SCOPE:

- 8d hologram can be implemented for the purpose of rescuing their lands
- It can also be implemented by using iot
- The location of the animals can also be deducted by using the gps technic





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S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6602	Antenna and Wave Propagation	Aperture and slot antennas, special antennas.

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EC6602 **ANTENNA AND WAVE PROPAGATION** **L T P C**
3 0 0 3

OBJECTIVES:

- To give insight of the radiation phenomena.
- To give a thorough understanding of the radiation characteristics of different types of antennas
- To create awareness about the different types of propagation of radio waves at different frequencies

UNIT I FUNDAMENTALS OF RADIATION **9**

Definition of antenna parameters - Gain, Directivity, Effective aperture, Radiation Resistance, Band width, Beam width, Input Impedance. Matching – Baluns, Polarization mismatch, Antenna noise temperature, Radiation from oscillating dipole, Half wave dipole. Folded dipole, Yagi array.

UNIT II APERTURE AND SLOT ANTENNAS **9**

Radiation from rectangular apertures, Uniform and Tapered aperture, Horn antenna , Reflector antenna , Aperture blockage , Feeding structures , Slot antennas ,Microstrip antennas – Radiation mechanism – Application ,Numerical tool for antenna analysis

UNIT III ANTENNA ARRAYS **9**

N element linear array, Pattern multiplication, Broadside and End fire array – Concept of Phased arrays, Adaptive array, Basic principle of antenna Synthesis-Binomial array

UNIT IV SPECIAL ANTENNAS **9**

Principle of frequency independent antennas -Spiral antenna, Helical antenna, Log periodic. Modern antennas- Reconfigurable antenna, Active antenna, Dielectric antennas, Electronic band gap structure and applications, Antenna Measurements-Test Ranges, Measurement of Gain, Radiation pattern, Polarization, VSWR

UNIT V PROPAGATION OF RADIO WAVES **9**

Modes of propagation , Structure of atmosphere , Ground wave propagation , Tropospheric propagation , Duct propagation, Troposcatter propagation , Flat earth and Curved earth concept Sky wave propagation – Virtual height, critical frequency , Maximum usable frequency – Skip distance, Fading , Multi hop propagation

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:

- Explain the various types of antennas and wave propagation.
- Write about the radiation from a current element.
- Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad band

TEXT BOOK:

1. John D Kraus," Antennas for all Applications", 3rd Edition, Mc Graw Hill, 2005.

REFERENCES:

1. Edward C.Jordan and Keith G.Balmain" Electromagnetic Waves and Radiating Systems" Prentice Hall of India, 2006
2. R.E.Collin,"Antennas and Radiowave Propagation", Mc Graw Hill 1985.
3. Constantine.A.Balanis "Antenna Theory Analysis and Design", Wiley Student Edition, 2006.
4. Rajeswari Chatterjee, "Antenna Theory and Practice" Revised Second Edition New Age

DESIGN OF PRINTED FRACTAL ANTENNA FOR WIRELESS APPLICATION

A PROJECT REPORT

Submitted by

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T. MOHAMED SALEEM **(Reg.no:311814106013)**

In partial fulfilment for the award of the degree

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BONAFIDE CERTIFICATE

Certified that this project report "**DESIGN OF PRINTED FRACTAL ANTENNA FOR WIRELESS APPLICATION**" is the bonafide work of "**S. MOHAMED ASLAM (311814106011), T.MOHAMED SALEEM (311814106013)**"who carried out the project work under my supervision.

19/4/18

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19/4/18

INTERNAL EXAMINER

19/4/18

EXTERNAL EXAMINER

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ABSTRACT

Wireless communications have been developed widely and rapidly in the modern world especially during the last two decades. The future development of the personal communication devices will aim to provide image, speech and data communications at any time, and anywhere around the world. This indicates that the future communication terminal antennas must meet the requirements of multi-band or wideband operations to sufficiently cover the possible operating bands. However, the difficulty of antenna design increases when the number of operating frequency bands increases within a single antenna. The aim is to study and design of Fractal microstrip patch antennas for wireless communication systems and study the effect of various antenna parameters like patch length (L), patch width (W), substrate dielectric constant, substrate thickness Gain(dB), Directivity(dBi), Bandwidth (%), microstrip line feed methods have been used to excite the patch antenna.

CHAPTER 6

CONCLUSION

Design and Analysis of Fractal Microstrip Patch antennas for wireless communication systems and study of various antenna parameters like patch length (L), patch width (W), substrate dielectric constant, substrate thickness Gain(dB), Directivity (dBi), Bandwidth (%) have been carried out. Microstrip line feed methods have been used to excite the patch antenna. FR-4 is chosen as substrate material with a thickness of 1.5. We observe three resonance frequency at 9.21 (-23.334-s11, Gain-1.4 dB, VSWR-1.1463, Directivity-3.72 dBi, Bandwidth-12.902%),10.548(-21.475-s11,Gain-0.247dB, VSWR-1.1844,Directivity-4.19dBi,Bandwidth-6.598%),12.039Ghz(-20.353-s11,Gain2.42dB,Directivity-8.49dBi, VSWR-1.2123,Bandwidth-5.307%).Thus can be used for multiband applications.

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Chennai-603 103.

L BAND MICROSTRIP ANTENNA FOR WEARABLE APPLICATIONS

A PROJECT REPORT

Submitted by

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In partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

MOHAMED SATHAK A.J COLLEGE OF ENGINEERING

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APRIL 2018

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(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)
SiruseriIT Park, Egattur, Chennai - 603 103

S.No.	Subject Code	Subject Name	Course that include experimental learning through project work
1	EC6007	Speech Processing	Basic concepts, speech analysis, speech synthesis.

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EC6007 **SPEECH PROCESSING** **L T P C**
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OBJECTIVES:

- To introduce speech production and related parameters of speech.
- To show the computation and use of techniques such as short time Fourier transform, linear predictive coefficients and other coefficients in the analysis of speech.
- To understand different speech modeling procedures such as Markov and their implementation issues.

UNIT I BASIC CONCEPTS **10**

Speech Fundamentals: Articulatory Phonetics – Production and Classification of Speech Sounds; Acoustic Phonetics - Acoustics of speech production; Review of Digital Signal Processing concepts; Short-Time Fourier Transform, Filter-Bank and LPC Methods.

UNIT II SPEECH ANALYSIS **10**

Features, Feature Extraction and Pattern Comparison Techniques: Speech distortion measures-mathematical and perceptual – Log-Spectral Distance, Cepstral Distances, Weighted Cepstral Distances and Filtering, Likelihood Distortions, Spectral Distortion using a Warped Frequency Scale, LPC, PLP and MFCC Coefficients, Time Alignment and Normalization – Dynamic Time Warping, Multiple Time – Alignment Paths.

UNIT III SPEECH MODELING **8**

Hidden Markov Models: Markov Processes, HMMs - Evaluation, Optimal State Sequence - Viterbi Search, Baum-Welch Parameter Re-estimation, Implementation issues.

UNIT IV SPEECH RECOGNITION **8**

Large Vocabulary Continuous Speech Recognition: Architecture of a large vocabulary continuous speech recognition system - acoustics and language models - n-grams, context dependent sub-word units; Applications and present status.

UNIT V SPEECH SYNTHESIS **9**

Text-to-Speech Synthesis: Concatenative and waveform synthesis methods, sub-word units for TTS, intelligibility and naturalness - role of prosody, Applications and present status.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:

- Model speech production system and describe the fundamentals of speech.
- Extract and compare different speech parameters.
- Choose an appropriate statistical speech model for a given application.
- Design a speech recognition system.
- Use different speech synthesis techniques.

TEXTBOOKS:

1. Lawrence Rabiner and Biing-Hwang Juang, "Fundamentals of Speech Recognition", Pearson Education, 2003.
2. Daniel Jurafsky and James H Martin, "Speech and Language Processing - An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition", Pearson Education, 2002.
3. Frederick Jelinek, "Statistical Methods of Speech Recognition", MIT Press, 1997.

REFERENCES:

1. Steven W. Smith, "The Scientist and Engineer"s Guide to Digital Signal Processing", California Technical Publishing, 1997.
2. Thomas F Quatieri, "Discrete-Time Speech Signal Processing – Principles and Practice", Pearson Education, 2004.
3. Claudio Becchetti and Lucio Prina Ricotti, "Speech Recognition", John Wiley and Sons, 1999.
4. Ben Gold and Nelson Morgan, "Speech and Audio Signal Processing, Processing and Perception of Speech and Music", Wiley- India Edition, 2006.

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HEALTH CARE MONITORING SYSTEM

A PROJECT REPORT

Submitted by

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In partial fulfilment for the award of the degree

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BONAFIDE CERTIFICATE

Certified that this project report "**HEALTH CARE MONITORING SYSTEM**" is the bonafide work of "**N.SHAMEER (311814106025), S.SYED HAJA SHEREEF (311814106028)**"who carried out the project work under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTARCT

Health care sensors are playing a vital role in hospitality. Patient monitoring system. A major improvement in hospitality because of its advanced technology. A system is used to measure heartbeat and body temperature. Which will detect the heart beat rate body temperature of the patient .If the heart beat and body temperature varies and reaches the critical level the message and call alert will be send to the doctor. When the acknowledgement is given by the doctor the auto injection process is implemented and the injection is injected to the patient.

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TEMPERATURE RATE:

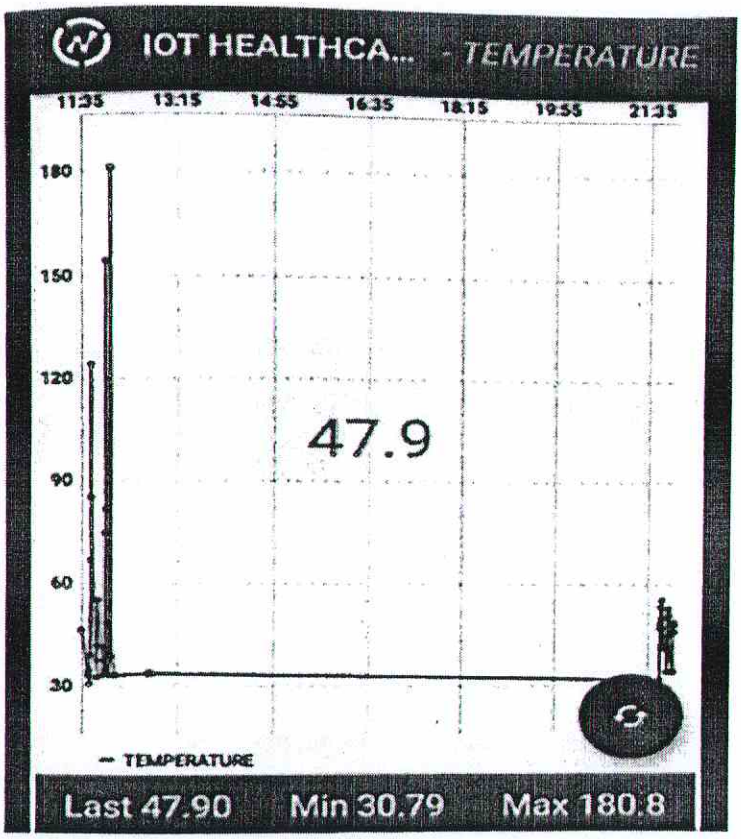

Fig 6.2 Output for temperature rate

6.2CONCLUSION

After creating the channel, we want to connect it with thing speak application which is available in paystore. In this modern world there is a development of technology but according to strategy a patient may loss a life due to a simple careless mistake of the nurse and doctor due to their change in working shift. To reduce all this factor our project focus them and gives a chance for avoiding all these factors. The Paper proposed is used to monitor the patient's heart beat and