

REVIEW ON OVERLAPPING ACOUSTIC EVENT CLASSIFICATION

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ABSTRACT

It is important to know not only speech and music, which has been researched but also common sound in day to day environment each time sound signal contain a combination of information as a mixture of noise, clean sound and noise like characteristics with flat spectrum have extract audio event from audio signals. In this review have propose an approach Mel-Frequency Cepstral Coefficients (MFCC) feature extraction technique, for the classification process To classifies overlapping sound events, we use a support vector machine (SVM) to feature extraction using the statistics that mainly contains Mel spectra where the most relevant feature frame based classification using SVM is a algorithm that analyses the data for classification and recognition it is a important machine learning technique.

Keyword— Mel-frequency Cepstral Coefficients (MFCCs), support vector machine (SVM), Acoustic event classification (AEC), Acoustic event detection (AED), Non negative matrix factorization (NMF), Hidden markov Module (HMM)

1. INTRODUCTION

In background each surrounding environment has its own set of sounds. For instance sounds generated from vehicles, horn, refrigerator running, ringing phone belong to the background. The sounds present in a particular environment are called acoustic events.

AEC aim to categorizes the audio elements inside an audio clip classifies the overlapped acoustic events in audio can be used in various uses, including indoor environment recognition, surveillance systems and automatic audio indexing Overlapping AEC is a much more puzzling difficult due to the combination of acoustic sources and is measured to be more significant because acoustic events frequently overlap with each other in actual lifetime records spectral features used for speech gratitude may not be suitable for AEC. Hence finding of new features specific to AEC is a interesting task in that environment the human activity is reflected in a rich variety of acoustic events either produced by the human body or by objects handled by humans. Consequently detection or classification of acoustic events may help to detect and describe the human and social activity that takes place in the room. For example clapping or laughter inside a speech discourse, a strong yawn in the middle of a lecture, a chair moving or door noise when the meeting has just started, Acoustic event is a segment of environmental audio that easily occur in human life, such as coughing, phone ringing, clash sound and so on. AEC and AED aim to recognize the audio elements inside an audio clip. Recognizing acoustic events in audio can be utilized in various applications including indoor environment recognition, surveillance systems and automatic audio indexing recently, as the interest in this area increases, huge datasets were released and challenges such as the challenge have been held. Research on AED can be separated into two main scenarios, overlapping and non-overlapping. Overlapping AED is a much more challenging problem due to the mixture of acoustic sources and is considered to be more important because acoustic events often overlap with each other in real life recordings. Automatic scene analysis includes several tasks that target at the acoustic sources segregation, localization, identification previously reported works have considered the problem of segmenting audio streams using a small number of categories or detecting a given

A Review: Ultrasonic Imaging Based Fetal Cardiac Chambers Segmentation and Detection of Abnormality

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Abstract Heart problems are the most common type of major birth defect and a leading cause of infant death, according to the Centers for Disease Control and Prevention. These defects are a result of underdeveloped chambers of the heart. The early detection can certainly have benefits. In this paper median filter are used to removal of noise and DWT is used to segmentation. By taking LV/RV ratio gestation period of baby can be determined in terms of week also any defect in the fetal heart can be identified.

Key words: ultrasound, filter, discrete wavelet transformation.

I. INTRODUCTION

Fetal cardiac defects are the most common abnormality found at birth and are the primary reason for the death of the new-born. These defects can be detected by many methods using ECG signals of fetus and mother. But The FECG will be contaminated by many of the unwanted signals such as power line interference, muscle contractions, respiration, skin resistance interference, and instrumental noise and uterine contractions. By using various filters can remove that noise but not fully. For that purpose ultrasound imaging is used to detect the cardiac defects also fetal growth.

II. LITERATURE SURVEY

Prabha *et al* [1] have presented the paper on ultrasonic imaging based fetal Cardiac chambers segmentation using discrete wavelet transforms. Doppler Ultrasonic imaging has been used to study the structural and functional aspects of fetal cardiac chambers. The ratio of left ventricle width to right ventricle width estimation closely matches with the theoretical bound for different gestation week.

Veenadevi *et al* [2] have presented a paper on extraction of fetal electrocardiogram from maternal electrocardiogram and classification of normal and abnormal signals. The method uses Kalman filter (KF), Least Mean Square (LMS) algorithm based on adaptive noise cancellation to extract fetal ECG. This method provides extract high quality, high signal to noise ratio fetal electrocardiogram from the mixture of maternal ECG, fetal ECG and various noises which gives clear picture of fetal heart beat signal.

Baumgartner *et al* [3] have presented a paper on SonoNet real-time detection and localisation of fetal standard scan planes in freehand ultrasound. In this paper, they propose a novel method based on convolution neural networks, which can automatically detect 13 fetal standard views in freehand 2-D ultrasound data as well as provide a localization of the fetal structures via a bounding box.

Jacob *et al* [4] have presented a paper on fetal cardiac structure detection from ultrasound sequences. They proposed a novel method for the detection of fetal cardiac structure from ultrasound sequences. This method is effective to detect the structure of fetal heart.

Marzbanrad *et al* [5] have presented a paper on automated estimation of fetal cardiac timing events from Doppler ultrasound signal using hybrid models. In this paper, a new non invasive method is proposed for automated estimation of fetal cardiac intervals from Doppler Ultrasound signal. This method is based on an oval combination of empirical mode decomposition and hybrid support vector machines—hidden Markov model.

Maraci *et al* [6] have presented a paper on a frame work for analysis of linear ultrasound videos to detect fetal presentation and heart beat. In this study the problem of automatically locating anatomical features in fetal ultrasound video specifically motivated by a real world global health application of low-cost ultrasound for identification of breech presentation and fetal viability. Ultrasound will give the effectively identify structures of interest and interpret the images with high confidence.

Krishna [7] have presented a paper on fetal ECG extraction using time-frequency analysis techniques. In this paper extraction of fetal ECG is done by using the combination of the commonly used Independent Component Analysis (ICA) technique and the Time Frequency Representation (TFR).

Zhang *et al* [8] have presented a paper on automatic image quality assessment and measurement of fetal head in two-dimensional ultrasound image. They used obstetric ultrasound due to its non invasive nature, low-cost, and real-time



ISSN (Print) : 2320 - 3765
ISSN (Online): 2278 - 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 4, April 2019

Three in One Smart Agricultural Device Using Arduino

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ABSTRACT: Agriculture is the backbone of Indian Economy. In today's world, as global population is growing at faster rate agriculture becomes more important to meet the needs of the human race. It plays vital role in the growth of country's economy. It also provides large ample employment opportunities to the people. Growth in agricultural sector is necessary for the development of economic condition of the country. According to statistics, agriculture uses 85% of available freshwater resources worldwide, and this percentage will continue to be dominant in water consumption because of population growth and increased food demand. The proposed system has been designed to overcome the unnecessary water flow into the agricultural lands, to control the unnecessary usage of fertilizer, to control pest and decaying of leaves using Internet of Things (IoT) and image processing. To combining all three setups such as Irrigation, Fertigation and pesticides spraying are controlled through a single device through a hand operated device.

KEYWORDS: Irrigation, Fertigation, Pesticides, IoT (Internet of Things), Image Processing, Embedded System, Image Processing.

I. INTRODUCTION

Agriculture is the foundation of Indian Economy. In this day and age, as worldwide populace is developing at quicker rate agribusiness turns out to be more essential to address the issues of mankind. It assumes indispensable job in the development of nation's economy. It additionally gives vast abundant work chances to the general population. Development in agricultural division is essential for the improvement of financial state of the nation. Shockingly, numerous ranchers still utilize the customary techniques for cultivating which results in low yielding of products and natural products, wherever mechanization had been actualized and people had been supplanted via programmed hardware, the yield has been progressed. Subsequently there is have to actualize current science and innovation in the agriculture part to build the yield. As indicated by measurements, farming uses 85% of accessible freshwater assets around the world, and this rate will keep on being predominant in water utilization on account of populace development and expanded sustenance request. Observing a natural variable isn't sufficient and finish answer for enhance the yield of the products. There are number of different variables that influence the profitability to awesome degree. These components incorporate assault of creepy crawlies and irritations which can be controlled by showering the product with appropriate bug spray and pesticides.

The fertigation framework was promoted with arrangement and dosification of compost and choosing **infusion strategy** too in the upkeep and administration of the framework. Manures infused through sprinkler water system frameworks in a procedure called fertigation are one sort of small scale water system framework. Irrigators wishing to infuse synthetics have an assortment of infusion gear from which to pick, including differential weight or clump tanks, bladder tanks, venturi gadgets, and positive uprooting pumps. The arrangement's fixation is reliant upon the infusion techniques. Compost consistency could be significantly impacted by infusion strategy and administration amid the infusion procedure. It was likewise announced that infusion rate had a more huge impact on fertigation

Review Paper on Design and Implementation of Kogge-Stone Adder Using Cadence Virtuoso

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Abstract—In Very Large Scale Integration (VLSI) designs, Parallel Prefix Adder (PPA) have better delay performance. A parallel prefix adder involves the execution of the operation in parallel which can be obtained by segmentation into smaller pieces. The binary addition is the basic arithmetic operation in digital circuits and it is essential in most of the digital systems including Arithmetic and Logic Unit (ALU), Microprocessor and Digital Signal Processors (DSP). At present, the research continues in increasing the adder's delay performance. In this paper the investigation of Kogge Stone Adder (KSA) using Carry Look-ahead Adder (CLA) is done. These adders are implemented using Cadence Virtuoso Platform in both the front-end and back-end design.

Keywords—PPA, ALU, KSA, CLA

I. INTRODUCTION

Binary adders are one of the essential and broadly utilized arithmetic operation in current Integrated Circuits (IC's). They tend to play a critical role in determining the performance of the design. Arithmetic operation is the normal regular task in advanced incorporated circuits. The least complex circuit includes addition, subtraction and multiplication or divisions. The computation should be fast and the area consumed by the computation should be fast and the power consumption should be less. These are the essential necessities for any adders. Parallel processing is a type of calculation in which numerous figuring are done at the same time, working on the rule that substantial issues can regularly be separated into simpler ones, which are then settled simultaneously in parallel. These are a few unique types of parallel registering bit level, instruction level, data, and task parallelism. Parallelism has been utilized power consumption and consequently heat generation by computers has become a major concern in recent years, parallel computing has become the dominant paradigm in computer architecture, mainly in the form of multi-core processors.

Parallel computers can be roughly classified according to the level at which the hardware supports parallelism, with core and multi-processor computers having multiple processing elements within a solitary machine. Area and time devoured by the circuit are the essential critical prerequisites. Numbers can be spoken to in advanced circuits in different ways. Thus, developing efficient adder architecture is crucial

to improving the efficiency of the design. Carry Look-ahead Adder are based on the parallel prefix computation. After many years of research, focus is on improving the delay performance of the adder.

II. LITERATURE REVIEW

Penchalaiah and Kumar [1] did research on a new PPA architecture called KSA which was proposed for 8, 16, 32 and 64-bit addition. The proposed method was implemented and the results were validated by the comparison of KSA with CSKA in terms of area, delay, speed and power consumption. The obtained results on the proposed KSA reported the minimum energy consumption compared with the CSKA along with area compaction and high speed. The proposed method can be very useful in high speed applications.

Hoe et al. [2] has proposed three types of carry-tree adders (the Kogge-Stone, sparse Kogge-Stone, and spanning tree adder) and compares them to the simple Ripple Carry Adder (RCA) and Carry Skip Adder (CSA). These designs of varied bit-widths were implemented on a Xilinx Spartan 3E FPGA and delay measurements were made with a high-performance logic analyzer. Due to the presence of a fast carry-chain, the RCA designs exhibit better delay performance up to 128 bits. The carry-tree adders are expected to have a speed advantage over the RCA as bit widths approach 256. Hence it is concluded that the carry-tree adders eventually surpass the performance of the linear adder designs at high bit-widths, expected to be in the 128 to 256 bit range.

Shilpa C. N et al. [3] worked on the design and performance of the Kogge Stone Parallel Prefix Adders and implemented it using different design technique. CMOS (Complementary Metal Oxide Semiconductor) and GDI (Gate Diffusion Input) are the different design technique used. The design and simulation of logic gates were performed on CADENCE Design Suit 6.1.6 using virtuoso and ADE Environment at GPDK 180nm technology. The execution measurement considered for the performance of the KSA is delay, number of gate count/Transistor Count (area) and power. Simulation studies are done for 4-bit, 8-bit and 16-bit input data. The results of the comparative analysis, showed how the performance can vary from 4 bit to 16 bit adder architecture.

PCM MUX Encoder for Telemetry System using VLSI

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Abstract: The progress of highly systematic Very Large Scale Integration (VLSI) technology and instant advancement of FPGA & CPLD architectures has created an uprising in the design approach of complex electronic systems. With highly progressed integrated system design methodology, the discrete event driven system designs are moderately replaced. The present paper illustrates the VLSI based implementation of Pulse Code Modulated (PCM) multiplexer and encoder schemes for telemetry system. It additionally analyses the functional effectiveness as well as performance in the telemetry data acquisition system. The present system accepts slow differing analog Automatic Gain Control (AGC) signals from azimuth elevation tracking error signals as well as telemetry receivers from tracking antenna controller and multiplexes them into single digital Pulse Code Modulated (PCM) stream for real time recording with time stamping on PC based PCM decommuted system. The present system has the potentiality to record this data onto the analog magnetic tape, which can be played back later for review.

Keywords: PCM, MUX, VLSI

1. INTRODUCTION

Any combinational circuit can be represented as multiple inputs with single output. Multiplexers are used to design any digital combinational logic circuit. Hence it is required to design a multiplexer with low power consumption and high speed. The proposed system is a Pulse Code Modulated (PCM) multiplexer cum encoder (PCM MUX Encoder) which accepts slow differing analog AGC signals with maximal bandwidth of 100Hz from azimuth elevation tracking error signals as well as telemetry receivers from antenna controller. Individual signals are then multiplexed into single digital PCM stream for real time recording with time stamping on PC based PCM decommuted systems. PCM is the most broadly accepted form of digital source coding for all types of data and voice signals flexible for transmission over terrene as well as space areas. This is essentially a conventional waveform coding technique, which converts the information into 8 sequence of binary numbers. The PCM MUX-Encoder comprises of an eight channel analog to digital converter (ADC) and CPLD based PCM Encoder. The output of the PCM Encoder goes to analog magnetic tape recorder as well as PC based decommuted system. According to the Nyquist theorem, the sampling frequency (f_s) should be at least twice the signal frequency (f_m) i.e., ($f_s > 2f_m$), but in the present case, f_s is taken as 5 times f_m , for the processing of signal and greater reproduction correspondingly with the Inter Range Instrumentation Group telemetry standard. The input sample is a Pulse Amplitude Modulated (PAM) waveform with samples that appears after every ADC sampling interval. Through the encoder the amplitude of the Pulse modulated signal is then approximated to convert it into PCM signal. The dynamic range covers the minimum to maximum amplitude of (0 to 5) Volts, being split into required number of quantization levels. Each level has been represented by an eight-bit binary code with a dynamic range of 255 levels ($2^8 - 1$). The ADC is having a conversion time of 100 Ms, but in the present design for avoiding the overlapping of two successive conversions additional 60 Ms has been provided. Hence, the total conversion time becomes 160 Ms, which gives sampling frequency of 6.25 kHz. Sampling frequency becomes nearly 780 Hz for each of the eight obtainable analog channels, sampling. The sampling frequency should be 5 times the signal frequency as per the IRIG standard. Thus, the maximum frequency to be sampled becomes 156Hz.

The eight continuous signals are digitized sampled and encoded into 8 bits consecutively by selecting ADC MUX addresses. The 3 bits of address (a, b, c) are generated by a 3 bit write counter for eight channels, which are clocked with a period of 160 Ms. From overcontrolled master crystal oscillator the above clock is generated, which operates at 1 MHz. Using Verilog programming language at RTL code level Other frequencies have been derived from this oscillator frequency. Only after the generation of a valid address, selection of the 1st channel assigned as channel '0' occurs. Address Latch Enable (ALE) signal of pulse width of 2ps is generated in order to meet the timing constraints of the design, after minimum address set-up time (t_s) of 50 ns. Then with a minimum pulse width of 2p a Start of Conversion (SOC) pulse is generated. It is observed that with 1 MHz ADC clock the conversion time of ADC (t_{ec}) is 90 Ms approx. Whenever End of Conversion signal from ADC goes high with respect to end of conversion output enable pulse is generated after 50ns to indicate the validity of the converted data. Thereafter, into the internal buffer '0' valid 8-bit data is stored, which is configured inside the CPLD chip. The handshake Signal-timing diagram between the ADC and CPLD is shown in Fig1. Based on the procedure followed for the channel '0' further channel '1' is selected as per the follow-up sequence of the multiplexed ADC channels and eight-bit data is stored in buffer 1. For the rest of the multiplexed analog channels similar procedure is followed. By another independent clock data buffers are read sequentially and with MSB first serially shifted out by 8-bit shift register. Only after shifting all the 8-bit of data of the previous data buffer, Parallel loading of next buffer data into shift register occurs. After the shifting of all eight buffer data corresponding to eight ADC channels two bytes of the

Development of Automatic Kannada Speech Recognition System

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Abstract

Automatic Speech Recognition (ASR) is the technology that allows human being to use their voices to speak with a computer interface in a way that, in its most sophisticated variations, resembles normal human conversation. Automatic speech recognition is an area of research which deals with the recognition of speech by machine in several conditions. This paper presents a brief survey on Automatic Kannada Speech Recognition Systems. Many research and developments are made to improve the performance of ASR to work more efficient by the researchers. The criteria for designing Speech Recognition system are data preparation, pre-processing filter, end-point detection, feature extraction techniques, speech classifiers, and performance evaluation. Speech recognition system for Kannada language has been implemented using the Hidden Markov Tool Kit (HTK). The objective of this review paper is to summarize the researches made by researchers in the recent year.

Keywords: Automatic Speech Recognition System (ASR), Mel frequency cepstral coefficients (MFCC), Hidden Markov Model (HMM), Hidden Tool Kit (HTK).

I. INTRODUCTION

Over the years, the development of speech recognition applications gives extremely useful contributions to this field of research and is becoming more mature in recent years. Speech is one of the fundamental way of communication mode of the human and, manmachine interaction is almost become basic necessity in this era. Speech processing is the study of speech signals and the different methods for processing of signals. The signals are normally processed in a digital representation, so speech processing can be considered as a special case of digital signal processing, applied to speech signals. Developing any kind of speech recognition system which can convert speakers spoken words in to particular form which a computer can understand and do further processing based on the application requirements can be a very useful tool. Automatic Speech Recognition (ASR) is the technology that allows human being to speak with a computer interface in a way that, in its most sophisticated variations, resembles normal human conversation.

Kannada is a language spoken in India predominantly in the state of Karnataka and is spoken by about 60 million speakers. This language is also spoken in neighboring states like Maharashtra, Tamil Nadu, Andra Pradesh, Goa etc. Karnataka has different dialect regions also. However, there is only little research reported on Kannada speech processing compared to other languages of similar importance.



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Review Paper on Water Monitoring and Leakage Detection

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Abstract:- Water is one of the most important natural resources essential for survival and it is supplied to cities through pipelines from water sources such as rivers and lakes. Non Revenue Water (NRW) is the amount of water which has been produced and lost before reaching the customer. It may be due to leaks, illegal connection and faulty meters.

Bearing in mind that water leakage is a global issue that has already grown to become a critical issue in many areas, the main objective of the paper is to develop a leak and water monitoring system, using the concept of IoT, flow sensor that can be used for detecting the leak and solenoid valves placed in different parts of pipeline can obstruct the water flow until the defective part of the pipeline is repaired. And further the leak occurred shall be informed to concerned authorities wirelessly.

I. INTRODUCTION

Water is vitally important to every aspect of our lives. Water represents a primary necessity for living things and is essential for agriculture, industry etc. Water management plays an important role in the society. In modern world, water leakage is considered as one of the largest and most serious problem. In developing country like India, loss of water in domestic sector on account of leakage is approximately 30 to 40% of the total flow in the distribution. By using water monitoring system, we avoid the water wastage, power consumption and easily preserved water for next generation.

Water pipelines leak detection; pipeline systems are responsible for transporting vital materials such as water, oil and gas. Any leakage in the pipe causes major financial losses and possible environmental damages. Leaks in water pipes may allow contaminants to enter water systems thereby reducing water quality and threatening the health of water users.

Leakage detection has historically assumed that all leaks rise to the surface and are visible. Leakages are mainly caused by generally aged and consequently breakable water distribution infrastructures. As pipes are not directly visible and accessible, the identification of leakages is not obvious. Losses from water supply system force water agencies to draw more water from lakes and streams thereby putting more stress on aquatic ecosystems. Once a leak is detected, the water utility must take corrective action to minimise water loss in the water distribution system. Accurate location and repair of leaking water pipes in a supply system reduces these

losses. Leaks reduce the reliability of water supply network. This may lead household and businesses to locate elsewhere, find alternative sources of potable water and otherwise find costly ways to protect themselves from the risk of unreliable water supplies.

II. RELATED WORK

Pipeline leakage detection is also affected by the soil type, density, depth, and surface coverage. Water pressure, pipe material and diameter have a significant impact on the detection accuracy due to the interference of frequency.

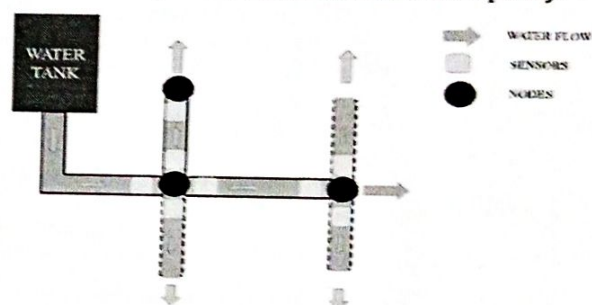


Figure 1: Generalized pipeline structure

A pipeline structure consist of multiple branches and nodes as shown in fig 1. Such structure can be broken down into elemental structure which consist of two branches and three nodes. At the point where two or more sub-pipes branch, a microcontroller is placed which takes in data from the sensor placed at each sub- pipes adjacent to it. In the structure water flow rate is measured using water flow rate sensor at inlet and outlet of a pipe. These flow sensors in turn are connected to microcontroller unit. The sensor does not obstruct the water flow but just collects the data of flow rate. Solenoid valve is an electromechanical device which is used to regulate the flow of liquid. The solenoid coil operates the valve as if it is being operated by the human being. When flow of certain quantity of liquid is required it opens the valve to required extent and when the flow is not required it shuts the valve entirely. The solenoid valve will be connected to microcontroller by interfacing with the relay module. The microcontroller units communicate with each other wirelessly. When a leak exist in a pipe, there would be a considerable difference in flow rates measured by two controllers. This can be used to detect leaks.



Ensemble EMD based Time-Frequency Analysis of Continuous Adventitious Signal Processing

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Abstract

The importance of lung sound analyses is increasing day by day very rapidly. In this paper, we present a new method for analysis of two classes of lung signals namely wheezes and crackles. The procedure used in this article is based on improved Empirical Mode Decomposition (EMD) called Ensemble Empirical Mode Decomposition (EEMD) to analyze and compare continuous and discontinuous adventitious sounds with EMD. These two proposed procedures decompose the lung signals into a set of instantaneous frequency components. Function (IMF). The continuous and discontinuous adventitious sounds are present in an asthmatic patient, produces a non-stationary and nonlinear signal pattern. The empirical mode decomposition (EMD) decomposes such characteristic signals. The instantaneous frequency and spectral analysis related to dual techniques specified above are utilized by IMF to investigate and present the outcome in the time-frequency distribution to investigate the qualities of inbuilt properties of lung sound waves. The Hilbert marginal spectrum has been used to represent total amplitude and energy contribution from every frequency value. Finally, the resultant EEMD analysis is better for wheezes that solves mode mixing issues and improvisation is seen over the EMD method.

Keywords: Adventitious, EMD, Hilbert spectral analysis, Wheezing, Crackle.

1. Introduction

The time-frequency analysis of adventitious sounds became more popular to achieve high accuracy of the diagnosed result. From Taplidou's era [12] time-frequency-based analysis of lung sounds has been designed. Thus, presented procedure utilizes a Short Time Fourier Transform which leaves the drawback of pathological and high noise robustness. The detection of robustness of different adventitious sounds well analyzed and presented [13]. Unfortunately, this could diagnose only internal noises leaving external noises unaltered. The respiratory sound wave (RSW) is multi-component, nonlinear, and non-stationary signals. This RSW consists of normal RSWs and abnormal RSW that is superimposed to RSW. There are mainly two types of abnormal RSWs are discussed in this context. The continuous adventitious sound RSW (CASRSW) as their duration is more than 85 milliseconds. The human ear can hear easily as the frequency range is between 100 Hz and 1 kHz. Thus, we can see the sharp peaks in the power spectrum. If the pitch of the wheeze is too low, then it usually referred as rhonchi (R.A.L.E. "Adventitious Sounds") and discontinuous adventitious sound RSW (DASRSW). Normal RSW is random in nature, whereas CASRSW is quasi-periodic waveforms with a duration of more than 80-100 ms and a fundamental frequency of over 100 Hz, and DASRSW are transient and short sounds (around 20 ms), with high-frequency components (above 300 Hz) [4,5]. Adventitious sounds are usually detected more rapidly indicating abnormality of the respiratory system. The respiratory waveform of abnormality gives many variations in the wave characteristics of bronchial and vesicular sounds but only a few are widely recognized as there is a difficulty in verbal description. Coarse lung sounds, for example, indicates lower frequencies

are accumulated and some of the higher frequencies are lost. The terms like cavernous, amphoric, conical and cogwheel also used but nowadays these are ignored as they are not having any clinical importance. As asthma becomes severe the wheezing is observed at the site chest. The variations in the normal respiratory sound exhibiting high pitched musical sounds which are produced in the airway is called adventitious sound. Adventitious sound can be noticed by a human acoustic system usually with inspiration and expiration stages. These adventitious sounds are continuous and discontinuous. The continuously generating adventitious sounds are called continuous adventitious sound (CAS), wheezes are the examples of CAS. The adventitious sounds that occur only for a certain period of time discontinuously are called discontinuous adventitious sound (DAS). The crackles are the examples of DAS and crackles are of two types, fine and coarse crackles. The discontinuous adventitious sounds (DAS) are short, popping sound signals. The CAS is low or piercing sound wave created at the time of termination phase of breathing. The 'Rhonchi in the bronchi', the rhonchi is heard in bronchi. The Hilbert - Huang Transformation is the exceptionally successful nonlinear frequency verification tool for adventitious sound waves. The Fourier analysis technique is appropriate if the wave is linear and stationary. The inbuilt segments of unusual irregular sound waves must be separated and broke down precisely using time-frequency mode of examination. The non-stationary sound wave examination using wavelet transform and spectral analysis method is a suitable approach. But HHT calculation is utilized for agreeable precise outcomes. The energy level spectrogram is also plotted with the help of Hilbert spectral analysis for better examination. The review of adventitious sound regarding spectrum analysis in control after some time is accomplished by wavelet transform which gives an ideal harmony among temporal and frequency exactness. The



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A Survey on Cardiac Signal Processing for Cardiovascular Diseases using ECG

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ABSTRACT

Heart Attacks are a significant reason for death on the planet today, especially in Karnataka, India. The need to anticipate this is a noteworthy need for improving the nations social insurance area. Exact and exact forecast of the coronary illness, for the most part, relies upon Electrocardiogram, ECG information. Coronary illness is a noteworthy perilous sickness that reason to death and it has a genuine long haul handicap. The time is taken to recuperate from heart illness relies upon patient's seriousness. Coronary illness finding is a mind-boggling task which requires much involvement and information. These days, the medicinal services industry contains a gigantic measure of social insurance information, which contains concealed data. Propelled information mining procedures alongside PC produced data are utilized for proper outcomes. Neural Network is broadly utilized device for foreseeing heart assault. A Heart Attack Prediction The framework we will create utilizing the Neural Network and Genetic Algorithm. This framework figures the quantity of concealed hubs for the neural system which train the system with the legitimate determination of neural system engineering and uses the worldwide improvement of the hereditary calculation for reinstatement of the neural system.

Keyword : - ECG (Electrocardiogram), Neural Network, Genetic Algorithm.

1. INTRODUCTION

The electrocardiogram (ECG) is the most significant bio sign utilized via cardiologists for demonstrative purposes. The ECG sign gives key data about the electrical movement of the heart. The heart sign is taken from ECG, which is known as Electrocardiography.

That the heart sign is picked by utilizing anodes in arms, leg, chest of our body. By utilizing this sign heart issue can be discovered. Rely upon the state of the ECG waveform, find

out the cardiovascular wellbeing. ECG signal readings and their investigation are done from the sign handling. Today sign handling assumes a noteworthy job in ECG signal investigation and translation. The point of ECG sign handling is various and includes the Improvement of estimation precision and reproducibility (when contrasted and manual estimations) also, by taking out the data isn't promptly accessible from the sign through visual appraisal. ECG is composite from 5 waves - P, Q, R, S and T. This sign could be estimated by terminals from the human body in the run of the mill commitment [1]. Heart Attacks are the real reason for death on the planet today, especially in India. The need to anticipate this is a noteworthy need for improving the nations medicinal services area. Exact also, the exact forecast of the heart assault mostly relies upon Electrocardiogram (ECG) information.

Neural Network is broadly utilized device for foreseeing heart illnesses conclusion. A Heart Disease Expectation System is created utilizing the Neural Network and Genetic Algorithm. This framework figures the quantity of concealed hubs for the neural system which train the system with the legitimate determination of neural system engineering and uses the worldwide improvement of hereditary calculation for the introduction of a neural system [1].

In this day and age, an ideal and savvy critical thinking methodologies are required in each field, paying little respect to basic or complex issues. Inquires about and designers are attempting to make machines and programming



PRINCIPAL

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Modelling of Notch Filter using Whispering Gallery Mode Resonator

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ABSTRACT

Whispering Gallery Mode Resonators represent a class of cavity devices with exceptional properties such as extremely small mode volume, very high power density, and very narrow spectral line width. In this paper we present the modelling of notch filter using Whispering Gallery Mode Resonator (WGMR) in terahertz frequency domain. We also discuss about the basic concept of WGMR, simulated result for frequency response of notch filter.

Keywords: WGMR, THz.

I. INTRODUCTION

Whispering gallery modes or waves are specific resonances modes of a wave field inside a given resonator (a cavity) with smooth edges. Notch filters can be used in a number of different applications where a particular frequency or band of frequencies needs to be removed. Often notch filters are fixed frequency, although it is possible to design some that have variable frequencies. Fixed frequency notch filters find applications such as removing fixed frequency interference.

In signal processing, a band-stop filter or band-rejection filter is a filter that passes most frequencies unaltered, but attenuates those in a specific range to very low levels. It is the opposite of a band-pass filter. A notch filter is a band-stop filter with a narrow stopband (high Q factor). WGMR correspond to waves circling around the cavity, supported by continuous total internal reflection of the cavity surface, that meet the resonance condition. After one roundtrip they return to the same point with the same phase (modulo) and hence interfere constructively with themselves, forming standing waves. These resonances depend greatly on the geometry of the resonator cavity. It is found that the increase of either effective microsphere size or the refractive index of the medium surrounding the microsphere down-shifts the WGM resonance frequency. The larger the change, the stronger is the shift. A linear relationship between the variation of microsphere effective size and the resonance frequency shift is found. Demonstrated the feasibility to simulate quartz and polyethylene whispering gallery mode resonators for the THz frequency range with coinciding mode spectra over more than ten times the free spectral range. Point out the advantage of large size and the possibility of post processing of WGM resonators in the Terahertz frequency range.

II. BASIC CONCEPT

Resonant phenomena in cavities of acoustic and optical domains frequently depend on the geometric properties such as size and shape, and also on the composition of the cavities. Such resonances are often known as Morphology Dependent Resonances (MDRs). An important example of MDR is that of whispering gallery mode resonator in the acoustic domain. The WGM in the acoustic domain comprises a moving pressure wave guided around a closed concave surface, like the whispering gallery in St. Paul's Cathedral shown in a schematic Figure 1(a). From geometric considerations, neglecting absorption, scattering, and material dispersion, these modes are guided by repeated total internal reflections and continue endlessly.



PRINCIPAL

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Special Purpose Machine to Improve Eye-Hand Coordination for Special Children

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ABSTRACT

Irrespective of physical and mental situation every child must get an opportunity to learn alongside playing. Unfortunately this does not holds good in case of children with special need.

The actual challenge comes into picture during the initial phase of learning. In most of the cases the incorporated traditional methods fails to get the attention of the child throughout the therapy session and they are quite human resource intensive. Teaching the special children within stipulated time with more efficiency and interactive manner with precise and modeled results is quite a challenge in itself.

Analyzing all the above problems the design has been proposed which can be used to train and enhance gross motor skills, eye-hand coordination and is an attention seeking device. The design houses a powerful microcontroller unit which handles complex algorithms and tasks with highest efficiency and precision. This design has visual, audio as well as a tactile (vibration) feedback associated with individual tasks to make every task interesting and interactive for the children.

The proposed design is light-weight, highly durable and a well-built with all the safety protections along with the precautions.

1. INTRODUCTION

The term special need is a catch-all phrase which can refer to a vast array of diagnoses and/or disabilities. Children with special needs may have been born with a syndrome, terminal illness, profound cognitive impairment, or serious psychiatric problems. Other children may have special needs that involve struggling with learning disabilities, food allergies, developmental delays, or panic attacks.

The designation "children with special needs" is for children who may have challenges which are more severe than the typical child, and could possibly last a lifetime. These children will need extra support, and additional services. They will have distinct goals, and will need added guidance and help meeting academic, social, emotional, and sometimes medical milestones. Persons with special needs may need lifetime guidance and support while dealing with everyday issues such as housing, employment, social involvement, and finances.

The actual challenge comes into picture during the initial phase of learning. In most of the cases the incorporated traditional methods fails to get the attention of the child throughout the therapy session and they are quite human resource intensive. Teaching the special children within stipulated time with more efficiency and interactive manner with precise and modeled results is quite a challenge in itself.



PRINCIPAL

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A Progress Review on Performance Improvement of Direct Methanol Fuel Cells Using Modified Nafion Membrane

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Abstract—Proton exchange membranes (PEMs) are important components of fuel cells in which either hydrogen or methanol are used as fuels. In this paper we propose to use methanol as fuel to realize micro direct methanol fuel cells (μ DMFC). The membrane electrode assembly (MEA) of μ -DMFC consists of a micro-porous layer which regulates the flow of methanol to the catalyst at the anode, a high efficiency catalyst layer for the generation of protons (H^+) from methanol, a high conductance membrane layer for the transfer of protons and a high efficiency catalyst at the cathode for the conversion of oxygen and H^+ into water. Simulation results indicate that the cell voltage decreases with increase in membrane thickness from 50 μm to 200 μm .

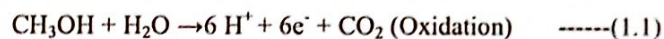
Keywords: PEM, μ DMFC, MEA, Nafion 117

I. INTRODUCTION

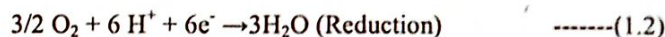
The Fuel cells are leading contenders for clean energy generation for variety of applications especially for wearable and portable devices. It is an energy conversion device which converts chemical energy of fuel in to electrical energy. The Direct-Methanol Fuel Cell (DMFC) is a subcategory of proton-exchange fuel cells in which methanol is used as a fuel. The DMFC devices are growing rapidly, recognized internationally and these devices are increasingly finding applications in many types of electronic devices. In recent years there is much demand on portable electronic devices such as cell phones and laptop computers. Therefore various energy storage and conversion systems have emerged in order to provide electrical power for portable devices with mechanical stability and high efficiency as well as environmental benefit and cost-effectiveness. DMFC has lot of advantages, such as low energy consumption, high energy density, simple system, abundant and low-cost fuel, which is easy to carry, storage and supply, and also a long time for power supply. Therefore, DMFC will be the most promising substitute for secondary batteries which are being used widely.

However, in India, there is no major effort in the development of technology for DMFC. The DMFC consists of a proton conducting membrane (Nafion 117) which is sandwiched between two gas diffusion layers (GDL); this Membrane Electrode Assembly (MEA) is the heart of DMFC. The Methanol diffuses through the micro-porous layer which

regulates the transport of methanol to the catalyst which generates protons. The protons then diffuse through the membrane to the cathode. The protons react with oxygen at the cathode to form water. The equations for the process are as below: Anode reaction:



Cathode reaction:



Overall reaction:

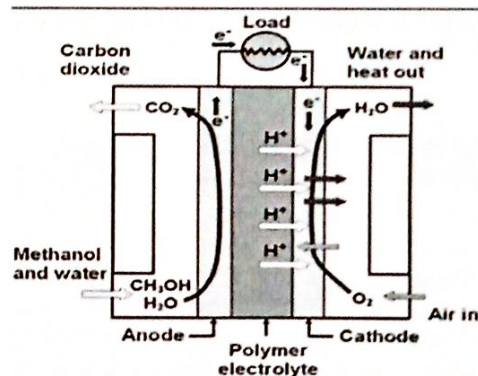
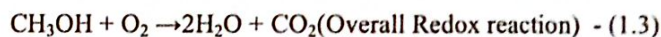


Figure1: Schematic of DMFC

The entire MEA is sandwiched between two silicon chips with micro channels which contain the flow of methanol at the anode and flow of air at cathode. The negative charge is collected by the metallic electrode, which moves into the external circuit from anode to cathode, thus balancing the charge transfer process. On the outside of the MEA, backing layers made of non-woven carbon paper or woven carbon cloth, are placed to fulfil several functions. The primary purpose of a backing layer is to provide lateral current collection from the catalyst layer to the ribs as well as optimized gas distribution to the catalyst layer through diffusion. It must also facilitate the transport of water out of the catalyst layer. This latter function is usually accomplished by adding a coating of hydrophobic polymer, polytetrafluoroethylene (PTFE), to the backing layer.

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Health Monitoring and Tracking System for Soldiers Using Internet of Things (IoT)

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Abstract

The paper reports a health monitoring and tracking system for soldiers based on internet of things (IoT). The proposed system can be mounted on the soldier's body to track the health status and current location of the soldiers using GPS. The information obtained will be transmitted to the control room through IoT. The proposed system consists of tiny wearable physiological equipment's, sensors, transmission modules. Hence, with the use of the proposed equipment, it is possible to implement a low-cost mechanism to protect the soldier's life on the battlefield. During wars and military search operations, soldiers gets injured and sometimes the connection will be lost. To find the soldiers and to provide the information about health of the soldier's army base station need Global Positioning System (GPS) device for locating soldiers, and a wireless transceiver to transmit the data wirelessly. Upon losing the connection in the battlefield it is necessary for the base station to guide the soldier. The base station can obtain the current status of the soldier which is displayed on the Personal Computer. The proposed system can be firmly fixed on the soldier's body to track their health status and current location using Global Positioning System (GPS). This information will be sent to the control room through Internet of Things.

Keywords: Arduino board, biomedical sensors, GPS, GSM, IoT, gas sensor, vibration sensor, Remote health monitoring, Tracking

1. INTRODUCTION:

Indian crowd are the third largest drove in the world with 1,200,255 active troops and 990,960 reserve troops. The soldiers will suffer a lot due to the unavailability of information of injuries to its personnel which increases death count. It is observed that the casualties are caused due to injuries rather than the direct assaults in the battlefield. The number can be minimized if the control room gets the real-time information about the health and location of the soldier. There are some issues regarding the safety of the soldiers. Knowledge of current location of soldiers, lack of continuous communication with the control room during the operations, lack of immediate medical attention and operations under different geographical conditions are the few safety issues. There is a necessity to develop a wearable technology which is less in size and dissipates very little power in the defense sector so that the location and the health parameters of the soldiers can be tracked in real time. By using this navigation system, the base station can guide the soldier to reach the desired destination. This device will improve awareness not only for the host but also for collocated military personnel who will exchange information using wireless networks.

The proposed system is based on IoT concept and will be helpful in the real-time continuous monitoring of soldier's health parameters and location. Pulse rate, humidity with body temperature, and oxygen level in an environment can also be monitored along with the location of the soldiers. During last decades, technologies like RF transceiver, cable-based systems, walkie-talkie, Zig Bee and GSM based tracking systems were most commonly used methodologies for the tracking of soldier's life during war. However, all these technologies suffered from one or more reasons like high installation cost, high noise, loss of signal, as well as the bulky nature. Hence, a wireless low cost and portable tracking system with high reliability is needed for the protection of valuable life of the soldiers in the battle field.

REVIEW PAPER ON AGRICULTURAL DROUGHT AND CROP FAILURE DATA ACQUISITION AND TRANSMISSION SYSTEM BASED ON IOT

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ABSTRACT:- Agribusiness required the devotion of numerous regular asset including, land, water, and ecological condition. The quality and amount of characteristic asset has debased throughout the years because of monetary issues related with expanded cost of info and diminishing ranch salary always declining land, labor, resources, and environmental issue, for example, soil and water contamination putting the suitability without bounds horticulture operation at chance. The solution for this, is to embrace the savvy agribusiness framework in light of IOT with help farming administration and development of products including less utilization of water, compost and pesticide.

I. INTRODUCTION

Agriculture is the main backbone of Indian economical growth. The most important barrier that arises in traditional farming is climate change. The number of effects of climate change includes heavy rainfall most intense storm and heat waves, less rainfall etc. due to these the productivity decrease to the major extent. Climate change also raises the environmental consequences such as the seasonal change in the life cycle of the plant. To boost the productivity and minimize the barrier in agriculture field there is need to use innovative technology and technique called Internet of things. The technological advances in their areas gather increasing momentum and this means that maintaining as the overview. The most important things of smart farming are environmental measurement and water management. The reason is that the environmental and water management affect plant growth.

The paper aims at making agriculture smart using automation and IOT technologies. The highlighting features of this paper include smart irrigation with smart control based on real time field data. Secondly temperature maintenance, humidity maintenance and other environmental parameters. And finally the recommendation to farmer for smart agriculture.

II. RELATED WORK

The methodology of proposed system is to build up automatic agriculture drought and crop failure using PIC Microcontroller. There is need to use ESP8266 Wi-Fi Module, soil moisture sensor, humidity and temperature sensor to collect crop field data and weather forecast website data for that particular crop field region is taken by the board and verify as per calibrated value then output is displayed.

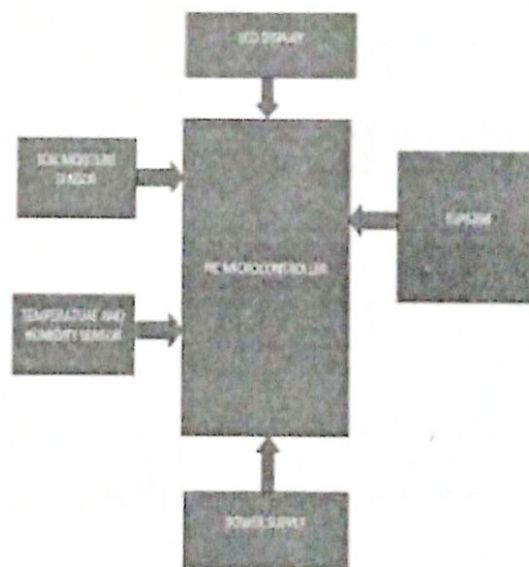


Fig. Block Diagram of Proposed system

Figure shows Block diagram of proposed system, PIC Controller for which ESP8266 Wi-Fi Module, soil moisture sensor, humidity and temperature sensor are interfaced to collect the crop field data and weather forecast website data for that particular crop field region on that particular time and next few days data is extracted by the program which is dumped in the board then the verify as per calibrated value then output is displayed.

Design and implementation of enhanced LECTOR technique for low power consumption in CMOS VLSI circuit: A Review

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ABSTRACT

With shrinking technology, power management is becoming an important factor for almost every design and application. The key challenges in deep sub micrometer technology are reducing the power consumption and overall power management on the chip. At the very early stage power management needs to be considered. Also, at every design stage low-power technique should to be employed, from RTL to GDSII. This paper describes various techniques for low power VLSI circuits. Future challenges that must be met with designers is to design low power high performance circuits.

Keywords: CMOS, Lector, Sleep, Stack, Sleepy Stack, nMOS, pMOS, Dual Stack, Low power consumption, delay

1. INTRODUCTION

These days, due to the advancement of handheld and battery-based devices with limited power capabilities, the major requirement are power efficiency and power-delay product. These two factors are of greater importance to the electronics designer. In the VLSI circuit design, power consumption of the circuit is of major concern. Development of mobile application alone has not lead to the demand for low power devices. The problem of power consumption is a major issue due to the evolution of mobile era. To overcome the problem of power dissipation, numerous techniques and procedures has been developed by researchers. But there is no standard technique or approach to address this problem. The designer needs to select the most appropriate technique taking into consideration the application requirements and product.

2. Literature Survey

Literature survey is an important part of the project. It enables assimilation of knowledge required for the project right from the problem definition, finding a solution for the same and its execution. The following section summarizes the literature survey carried out for the project.

2.1. Firdous *et al* [1] have proposed lector-based stack approach for power consumption minimization. Less delay compared to forced stacking during overcome this sleep transistor need control circuit. In proposed design circuit the main concept is charge sharing and recovering of stored charges between output capacitor and capacitance nodes.



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Smart Medicine Reminder with Smart Watch Using Arduino Nano

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Abstract: For elderly people, there is a need to design appropriate product and medication is one of the important component related to them. Management of medication is very important for acute illness and long term conditions. In Aged people, due to physical and mental function decline, they need to take number of drugs. In such scenario, management of complex medication is required for avoiding before it seriously affects health. Forget to take prescribed medicine is one of the problem, so there are several products designed for solving problem, such as electronic medication reminder device, smart phone reminder applications and many more. However, it is not possible for all elderly people to make use of smart phone. This paper proposes a system that will help not only elderly people for medication reminder but also person who is suffering from Alzheimer disease. Proposed system is combination of Smart watch and pillbox which will help user to manage complex medication regimes. Patients need not remember their medicine dosage timings as they can set an alarm on their medicine dosage timings. A led is placed in pillbox which blinks at particular time to take medicine. The alarm can be set for multiple medicines including time and medicine description.

Keywords: Smart watch, Pill box, Arduino IDE software, GSM technology

I. INTRODUCTION

In-taking of genuine estimations at proper time is an obligatory thing of every patient on the planet. The patients may incorporate kids, understudies, businessperson and matured people. They are constantly occupied with their everyday work. If they would encounter the evil impacts of any afflictions or sickness, by then it is critical to take their correct portions gainfully, especially senior individuals. If there should be an occurrence of senior residents, relatives are the person who should help the patients however because of their bustling calendar this isn't conceivable. Because of this distinctive issue emerge, for example, taking unpredictable medications because of patient's bustling calendar and absence of information about the drug. By then it is essential to take the best possible prescriptions for their extraordinary prosperity.

As the expense of the in-home restorative consideration rises, every individual search for a productive contraption to manage their medications fittingly. Despite the fact that there are diverse medication remnants it has been hard to work by elderly individuals. To maintain a strategic distance from such circumstances brilliant drug leftover

portion is produced to assist the patients with taking appropriate measurements adequately. The fundamental preferred standpoint of this framework is that elderly individuals can work this framework effortlessly.

II. LITREATURE SURVEY

Gomathi *et al* [1] introduced a paper, the objective of this undertaking is to help the patients for the confirmation of prescriptions at the ideal time. In this paper the time and drug names are changed by the patients through the keypad associated. The rundown of medications must be taken by the patient at the endorsed time is shown on Character Liquid Crystal Display (LCD) and the time is shown on seven fragment show. So in this manner the status of the patients can be effortlessly observed by the doctors. This is actualized utilizing Unified Technology Learning Platform. In this framework, Advance Risk Machine (ARM) cortex processor is utilized which depends on ARM form 7 engineering the fundamental purpose for utilizing this processor is because of elite and power proficiency.

Priyadarshini *et al* [2] proposed a paper on automatic medication reminder, this novel idea provides information to patients to take the right dosages at right time. It is necessary to the patient to take correct medicines at right quantity and time. A novel Automatic Medication Reminder (AMR) system is proposed in the paper. The proposed system is used to give information to patients automatically for taking proper dosage at accurate time which is mentioned in the prescription schedule. All the above details are done with the help of Master IC, keypad, LCD display. After that the controller is interfaced with RTC module to track the current time. All the three commands including Number of Tablets, Set time, Current time are displayed with the help of LCD display. LED indications and beep sound will be happened at corresponding medicine (tablet) container boxes. Similarly it can give the information for noon and night time also. This novel device is economical, smaller in size, better accuracy and less complexity in operation.

Lavima *et al* [3] presented a paper in which an embedded system is capable of taking care of the patients from all aspects. This project gives an experimental idea of patient's health condition and monitor environmental conditions. This system is designed using Zigbee and wireless sensor network


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REVIEW PAPER ON ESTIMATION OF DURABILITY OF RICE CROPS USING SENSORS

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ABSTRACT

Rice is one of the leading food crops in the world. It is one of the most important staple food crop of India for more than 2/3rd of its population. They directly supply more than 25% of calories consumed by the entire human population. Nearly 150 ha is the area harvested for rice crops. Rice is one of the world's largest cereal crops providing the caloric need for millions of people. Human consumption sums up to 85% of total production for rice compared with other leading food crops.

Since, the rice after farming are packed in huge sacks and stored in go-downs for months. It becomes very difficult to deal with the quality of the rice grains. During storage, a number of physicochemical and physiological changes occur, which are collectively termed aging, which affect the rice quality.

INTRODUCTION

Agriculture is the backbone of our country and economy, which accounts for almost 30 % of GDP and employs 70% of the population. Agriculture technology available in the 1940s could not be able to meet the demand of food for today's population, in spite of the green revolution. Similarly, it is very difficult to assume that food requirement for population of 2020 will be supplied by the technology of today. Grain moisture is one of the important factor.

The Farmers not only face many constraints to producing staple crops, but they also face many grain management challenges after harvest. By not being able to store effectively, most farmers cannot take advantage of price increases that occur during the production cycle. They often shift from sellers to buyers of grain during the storage season and therefore weaken their food security.

In addition, when effective storage technology is not available, traditional storage technologies often unable to dry and store grain properly can even lead to increased losses during storage. Unfortunately, farmers are limited in strategies to cope with storage losses because of credit constraints, risk aversion, lack of modern storage technology and unreliable information about grain prices. As a result, many farmers sell immediately after harvest in order to mitigate pest loss. Therefore, they forget potential profits that they would have earned had they held stocks at harvest and sold later in the marketing year when prices are typically much higher.