

**PROJECT TITLE** A MLL SYSTEM FOR THE STUDY OF ATRIAL ECG COMPONENTS

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**BATCH:** 2012-2016

**WORK PLACE;** VEL TECH MULTITECH DR RANGARAJAN DR SAKUNTHALA ENGINEERING COLLEGE

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The aim is to design a Modified Limb Lead (MLL) system, for specifically studying the characteristics of the atrial depolarization (P wave) and atrial repolarization (Ta wave) morphology in sinus rhythm healthy subjects. The present work investigated the involvement of the Ta wave in the MLL ECG recording and to study the characteristics and alternant of the Ta wave during the P-Ta interval. The MLL system is also used to record the ECGs in different subjects in order to study the characteristics and to assess the full duration of the Ta wave. The main focus is on the involvement of body surface potentials during normal atrial electrical activity and to assess the involvement of atrial repolarization wave in ECG. A modified limb electrode placed on the right side of the human torso which produces a MLL system is used to record the ECGs of the healthy subjects in sinus rhythm using the bipolar limb electrodes.

In general, Electro cardiology has been focusing its interest on the entire cardiac cycle, and specifically on the ventricular activity. Disorders and arrhythmias related to atria, on the other hand, have not been focused until recently. There are several reasons for this, but it is notable that the atrial disorders are often not directly linked to acute severity. The expression of the atrial depolarization (P wave) observable on the standard 12-lead ECG is so small and the atrial repolarization (Ta wave) has not been observed and recorded in the standard 12-lead ECG usually as the much larger QRS complex obscures it. For this reason, the Ta wave is seldom observed in the standard ECG except few abnormal conditions.

The main focus is on the involvement of body surface potentials during normal atrial electrical activity and to assess the involvement of atrial repolarization wave in ECG. A modified limb electrode placed on the right side of the human torso which produces a MLL system is used to record the ECGs of the healthy subjects in sinus rhythm using the bipolar limb electrodes. The data analysis is focused on the PR intervals, while devoting special attention to the low-amplitude signals during the PR segment i.e. the segment from the end of the P wave till the onset of the QRS complex

**PROJECT TITLE** AUTOMATIC VEIN VIZUALLIZER

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Diabetes Mellitus is a group of metabolic diseases characterized by high blood sugar (glucose) levels which results from defects in insulin secretion. Nowadays Diabetes is an increasing health problem in the world so patients rely on treatments like oral medications and manual injection of insulin because of the high cost of insulin pumps. But there are some new techniques being evoked, despite that people are unaware of that or unable to use it. So to help the common man, especially patients at the acute stage of Diabetes, a reliable and affordable embedded system solution including complete hardware and software development for continuous blood glucose maintaining system is proposed. The automatic insulin injector is to be designed in such a way that it is portable, gives maximum comfort and can be readily used by the diabetic patients.

Diabetes, often referred to by doctors as diabetes mellitus, describes a group of metabolic diseases in which the person has high blood glucose (blood sugar), either because insulin production is inadequate, or because the body's cells do not respond properly to insulin, or both. Glucose is the main source of energy to our body. Carbohydrates, proteins, fats that our body receives through food intake is digested and converted into glucose. This glucose is used by body cells for energy and excessive glucose should be converted into fat which will be stored in cells. The hormone that helps for conversion of excessive energy into fat is called insulin, produced by Beta cells of the Pancreas. The patient with diabetes fails to produce adequate amount of insulin to maintain the blood glucose level. There are three main types of diabetes: Type 1 diabetes occurs more frequently in children and young adults. Here, pancreas fails to produce sufficient amount of insulin. Type 2 diabetes is much more common and nearly 90-95% of adults fall under this category. Here insulin produced is defective and cannot move glucose to cells. The most common complication of Type 2 diabetes is heart disease, also known as macro-vascular disease, leading to heart attack. It may also increase risk of developing micro-vascular disease of eyes, kidneys and nerves which can result in blindness, kidney failure, foot ulcers requiring amputation, and impotence in men. These complications usually occur after many years of diabetes due to delay of medication. The Gestational diabetes type affects females during pregnancy. Some women have very high levels of glucose in their blood, and their bodies are unable to produce enough insulin to transport all of the glucose into their cells, resulting in progressively rising levels of glucose. Diagnosis of gestational diabetes is made during pregnancy. Undiagnosed or uncontrolled gestational diabetes can raise the risk of complications during childbirth. The baby may be bigger than he/she should be. Insulin is most commonly made in laboratories today. It can also come from animals, mainly pigs.

**Insulin pumps** are about the size of an electronic pager and can be worn on a belt or in a pocket. They deliver insulin through a flexible tube inserted under the skin near the abdomen. The user gets a continuous flow of basal insulin, as well as larger bolus doses that are released by pressing a button at mealtimes or at other times when blood sugar levels are above the target range. However, insulin pumps require attention in order for them to give you good results:

**PROJECT TITLE** EXTRACTION OF HYDROXY APATITE FROM EGG SHELLS FOR DENTAL APPLICATIONS

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Biomaterial is an important field of modern research dealing with construction of artificial organs, rehabilitation devices or prostheses and to replace natural body tissues . Recent researches in biomaterial concerned on bone and nerve regeneration using synthetic bio degradable polymers. Hydroxyapatite which is an important constituent of teeth can be prepared from natural bio waste egg shells. The calcium oxide from the egg shells is achieved by hydrothermal method. Hydroxyapatite powder is achieved due to the reaction of Calcium oxide with saturated  $(\text{Na}_2)\text{HPO}_4$  followed by heating treatment. The synthesized powder is characterized by Fourier Transform Infrared Spectroscopy (FTIR) and Scanning electron microscopy (SEM ). XRD is also used in analysis which shows crystallinity. The synthesized powder were formed fairly uniform shape determined by the SEM. Hydroxyapatite derived by this natural way can be used for dental applications because of their composition is similar to bones and teeth. The prepared Hydroxyapatite powder was blended with Gelatin to ensure its binding nature so as to be used as a dental filler. The importance of using this Hydroxyapatite for dental applications is of its biocompatible nature with mechanical strength and durability to carry out the desired function and can be used as a new type of dental cement with the same basic components of teeth structure. Because of its biocompatible nature, lack of disease transfer risks, ease of use and unlimited availability, Hydroxyapatite remains a viable choice as dental fillers. With this development, eggshell environmental waste has made a significant contribution in the production of biomaterials used in medical applications

**APPLICATIONS:**

- Identifications of simple mixtures of organic and inorganic compounds both as solids or liquids.
- Identification of polymers and polymer blend.
- Indirect verification of trace organic contaminants on surfaces.
- Thin film analysis.
- UV or other degradation or de-polymerisation of polymers and paint coatings.
- Analysis of unknown solvents, cleaning agents and detergents

**PROJECT TITLE** NON INVASICVE BLOOD GLUCOSE DETECTION FOR DIABETICS WITH IOT APLICATION  
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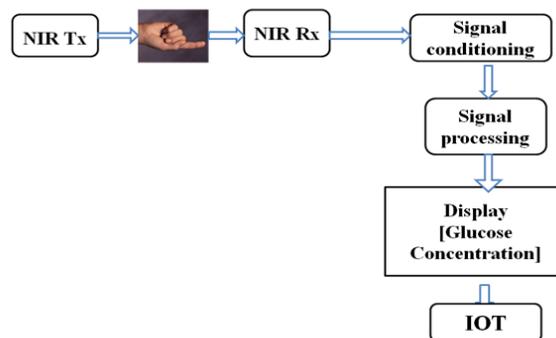
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Diabetes is one of the biggest health challenges, nowadays. Detection of blood glucose plays a vital role but in case of type 1 diabetics, people have to test their glucose level more than three times per day which makes invasive method, a tedious process. Thus, noninvasive method has been used which is based on near-infrared spectroscopy, detects the glucose component effectively within the range of 750nm to 1400nm. This detection is done using MATLAB processing to avoid the bit errors which happens while detecting in microcontroller. In addition it has IOT, to monitor people’s glucose level by their respective doctors and the needed insulin level can be suggested time to time through this process. Since timely suggestions are given, people need not to wait for their results and do not have to think about managing diabetes

This proposed system deals with measurement of glucose value using NIR in which it has a deeper penetration level and glucose value can be clearly estimated without interacting with any other compounds in blood (e.g. water) and also temperature independent. Particular wavelength of NIR will enables the vibration of glucose molecule in their respective overtones. The absorption of glucose molecule depends upon the sensitivity of NIR wavelength.

The sensed value of glucose signal is then conditioned and then processed with SIGVIEW software and MATLAB software. The process includes filtering (Combination of high pass and low pass) to avoid baseline wander and muscle noise. This glucose value is displayed and then directed to their respective physicians through IOT (Internet of things).

**Block Diagram**



**PROJECT TITLE** WHEEL CHAIR FOR PARALYZED WITH COLLISION AVOIDANCE MECHANISM  
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Rehabilitation engineering is the application of engineering sciences to design, develop, adapt, test, evaluate, apply, and distribute technological solutions to problems faced by individuals with disabilities. Technology that is used to help increase functional capabilities is often called assistive technology. The assistive device acts as a boon for them. The most widespread assistive device is the wheelchair. It is commonly involved in promoting good posture and independent mobility. Physically challenged people face barriers at their each turn and they need some helpers in their daily works. Usually it requires the use of the upper body for manoeuvring the wheelchair and performing transfers, weight reliefs and activities of daily living. This project allows the users to go for walks on their own, to reach high shelves, climb and descend stairs unassisted. It also involves an ergonomically designed motor wheelchair for domestic use by physically challenged people. The prototype has components like Caterpillar tracks, Motor, Controller.

#### OBJECTIVE

The Objective of this project is to develop a Wheelchair with Stair climbing mechanism which is capable of moving gutters and going up/down staircases. It involves an ergonomically designed motor wheelchair for domestic use by the physically challenged people. It can help the user to do the work on their own, can traverse on any surfaces like sand, gravel, steps, etc. It is achieved by the usage of Caterpillar (Continuous) tracks, Motor, Controller. It helps the wheelchair users to be individualistic

#### BLOCK DIAGRAM

