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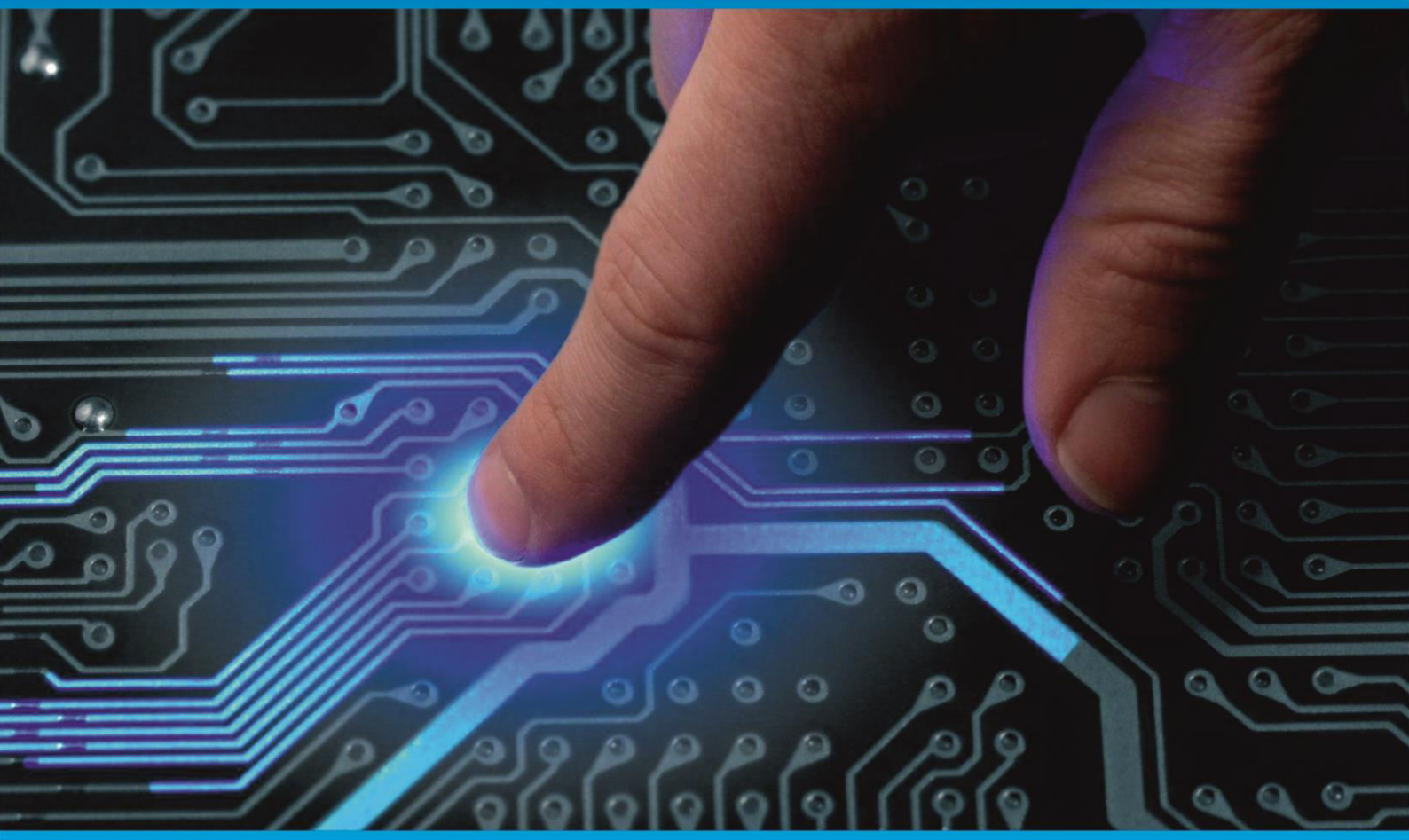

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Advanced Portable Medical Kit Using IOT

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ABSTRACT: Electrocardiography is the process of producing an electrocardiogram (ECG or EKG). It is a graph of voltage versus time of the electrical activity of the heart using electrodes placed on the skin. These electrodes detect the small electrical changes that are a consequence of cardiac muscle depolarization followed by repolarization during each cardiac cycle (heartbeat). Changes in the normal ECG pattern occur in numerous cardiac abnormalities, including cardiac rhythm disturbances (such as atrial fibrillation and ventricular tachycardia), inadequate coronary artery blood flow (such as myocardial ischemia and myocardial infarction), and electrolyte disturbances.

I. INTRODUCTION

• The electrocardiogram is a graphical representation of the bio-electrical currents generated by the myocardial cells. The conductivity of the body allows the detection of these currents on its skin. By placing a pair of electrodes on the body, an ECG voltage potential between them can be measured and recorded. This graphical representation (ECG) can be either printed on a paper or displayed on a monitor. The device capable of recording and printing the ECG on paper is called electrocardiograph. The device which displays the ECG on a screen is called monitor or cardiac monitor. An electrocardiograph consists of electrodes, electrode cables, amplifiers, filters, control modules, paper recording module and special graph paper. Modern electrocardiographs also contain a monitor screen, to display the ECG, and some of them are even capable of providing an interpretation of the electrocardiogram. Before it was possible to display the ECG on a monitor, the ECG was only printed on special graph paper. Einthoven was the inventor of the first device capable of printing the ECG on paper.

II. LITERATURE SURVEY

• An important component of ubiquitous healthcare is wireless sensor network (WSN). WSNs are an emerging technology that is poised to transform healthcare. The WSNs promise to make life more comfortable by significantly improving and expanding the quality of care across a wide variety of settings and segments of the population. This paper provides a brief introduction on applications of wireless sensor networks in healthcare . This paper reviews the various types of wireless technologies used for medical applications such as WLAN, WPAN, WIMAX and WBAN and states their frequency, range standard etc., These wireless technologies are compared based on the factors such as energy consumption, security, routing protocols in order to increase the efficiency and effectiveness of the monitoring system . In parallel to WSNs, the idea of internet of things (IoT) is developed where IoT can be defined as an interconnection between identifiable devices within the internet connection in sensing and monitoring processes .

• Measurement of Elder Health Parameters and the Gadget Designs for Continuous Monitoring Improving the quality of life for the elderly persons and giving them the proper care at the right time is the responsibility of the younger generation a simple, compact and user-friendly electronic gadget for continuous monitoring of elder health parameters is the need of the hour. Day by day the menace of weakening health and chances of skin related problems, bed sores etc are becoming critical in case of bed ridden patients. This paper analyses the old age diseases and the parameters to be monitored . A Zigbee-Based Wearable Physiological Parameters Monitoring System can be used to monitor physiological parameters, such as temperature and heart rate, of a human subject.

• The system consists of an electronic device which is worn on the wrist and finger, by an at-risk person. Using several sensors to measure different vital signs, the person is wirelessly monitored within his own home. An impact sensor has been used to detect falls. The device detects if a person is medically distressed and sends an alarm to a receiver unit that is connected to a computer. This sets off an alarm, allowing helpto be provided to the user .

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Technology which is well into existence and reduces cost of electrical wiring and uses the already available power line wires known as the power line communication. The intent of this work is to send the biomedical parameters like the heart rate, respiration rate and body temperature through PLC system Some of the elder care systems as mentioned in monitor activities of the elders in their home. They embed a video system in the living environment of elders and continuously monitor their activities at home. However, this system doesn't measure any of the vital parameters of the elderly patient. Measuring the vital parameters is inevitable if the elder person suffers from any sort of heart ailments, which are very common in individuals aged above 60 .

• In mobile devices like Calyx (Complete Ambient Assisted Living Experiment) which can measure vital signs like ECG, pulse, Blood pressure, Movement and Fall detection. However, the design we have proposed can monitor vital parameters and fall detection along with tilt monitoring for the bed-ridden patients to monitor any case of bedsore. Some devices as in monitor only fall detection for the elderly patients based on the sensor readings from accelerometers and microphones attached to the body of the patients. The system proposed is applicable to p atients.

• And elders for activity monitoring and fall detection and also sports athletes exercise measurement and pattern analysis. A wearable wireless sensor network using accelerometers has been developed in this paper to determine the arm motion in the sagittal plane. The system provides unrestrained movements and improves its usability. The lightweight and compact size of the developed sensor node makes its attachment to the limb easy. Experimental results have shown that the system has good accuracy and response rate when compared with a goniometer.

III. PROPOSED METHODOLOGY

- In this project we have utilised the internet of things application that the ecg readings can be viewed anywhere in the world, provided there should be an internet connectivity.
- This can also be bypassed by another way when the person is nearer theycan connect them using Bluetooth and they can see the graphicrepresentation of the ecg with continuousmonitering
- Basically the traditional ecg machine is expensive and not portable, so we have innovated an compact ecg machine, to reduce the cost and to provide portability.
- This can be used as an heath monitoring system that involves bedridden patient , persons working in furnaces and boiler industries, the athlete and the army soldiers who are in the remote area in border

IV. EXPERIMENTAL RESULTS

As shown in fig(1),the ecg waveform of a person can be viewed in mobile application by placing the electrode on the patient and we have used AD8232 which converts analog to digital signal and then the information is passed onto ESP8266 which is an Bluetooth and wifi module which transmits the information to the mobile application,using internet of things we can monitor the patient anywhere in the world.we have also include solar panel to power up the circuit when sunlight falls on it.fig (2) denotes the ecg waveform of another patient.Any dc power source can be used for this circuit.fig (3) and fig(4) denotes the experimental setup and working of the project.we have also included gsr sensor in our project which is measured in our fingertips denotes our stress level and displays in mobile application.we have utilised Bluetooth graphics software for simulation of ecg waveform.

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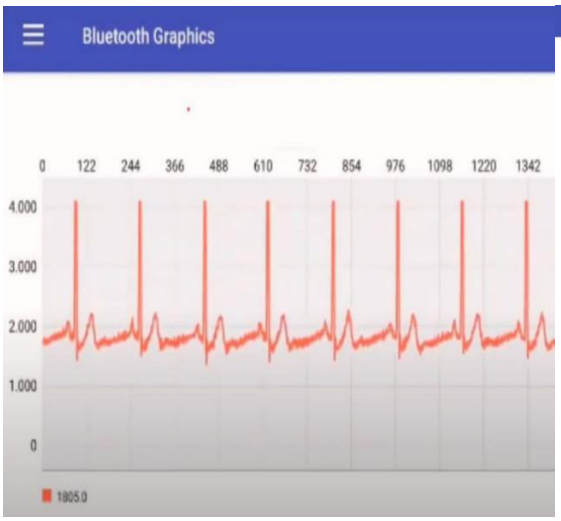

Fig 1 ECG OUTPUT WAVEFORM 1

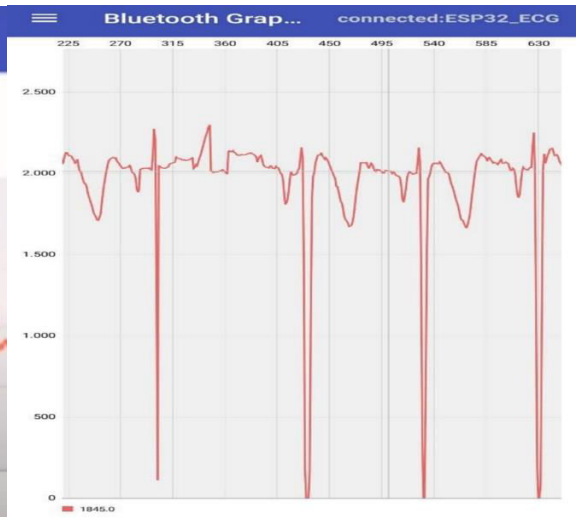

Fig 2 ECG OUTPUT WAVEFORM 2

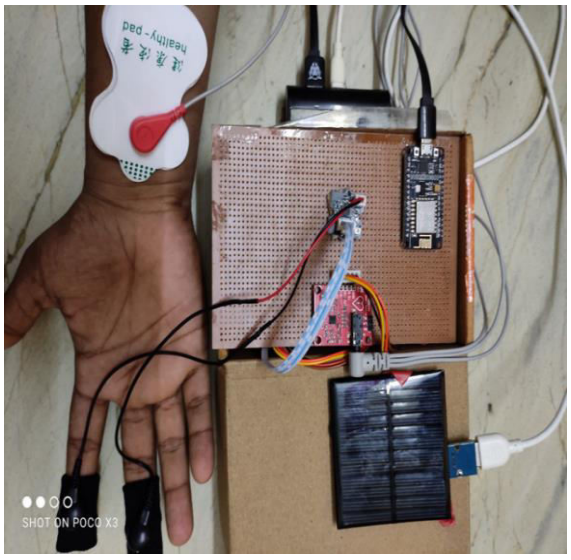

Fig 3 EXPERIMENTAL SETUP OF PROJECT

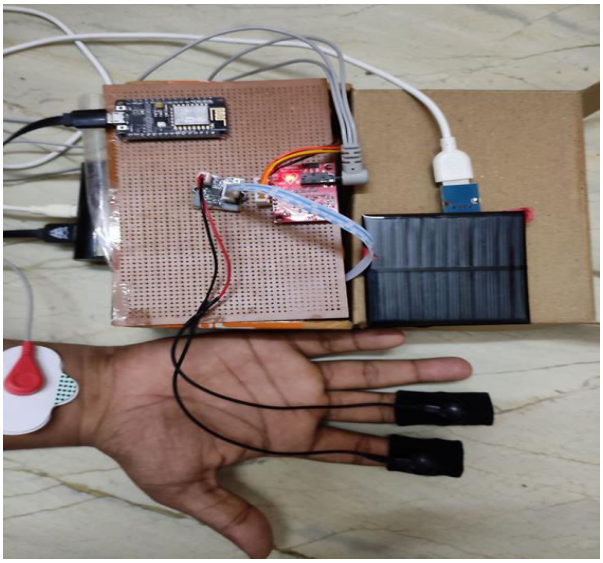

Fig 4 EXPERIMENTAL WORKING OF PROJECT

V. CONCLUSION

The portable ecg machine that we have designed will overcome the problems faced in the traditional ecgmachines.such as cost effective,portable and user friendly.we have also increased the accessibility of the device.Any medical emergency can be immediately reported to nearest hospital and can seek help from doctor and save life.

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