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ECG With Temperature Sensing And Sudden Informer

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ABSTRACT: Through these paper we have obtained a new and improved health monitoring system. For robustness, the proposed system is equipped with analysis capabilities. The temperature sensing need that for the patients fever condition. So we have the heart patient is always in under our consideration. The IoT enviornment that is not only a networking but also make a sudden impact that can make attention to the person who have the week health. In these paper introduces the ECG detection through the technique photophlythmography(ppg) the temperature condition of the person using a temperature sensor and the blood pressure detection also.Here the high cost and high weight equipment problem removed by inventing wearable heart monitoring systems with a finger tip analysis.

Key words:IoT,ECG monitoring, ppg

I.INTRODUCTION

We have to enable personalization of treatment and management options with the simplest particularities.Various studies have been conducted related to the development of remote healthcare systems, especially heart rate monitoring systems. Most of these studies have focused on four main topics: sensor technology, wearable systems, signal processing, and mobile monitoring systems. Researchers have tried to develop sensors that are able to sense bio-signals without generating side effects or distracting users .These work will help the reduction of cost from the heavy equipments and designing a multiple health activity sensing. It views enabled by the Internet of Things (IoT), smart and connected health care is a particularly important one. Networked sensors, either worn on the body or embedded in our living environments, make possible the gathering of rich information indicative of our physical and mental health. . In this work, we highlight the opportunities and challenges for IoT in realizing this vision of the future of health care.

II.LITTERATURE SURVEY

The standard procedure in a hospital to measure an electrocardiogram (ECG)is to use a 12-lead ECG. In a conventional 12-lead clinical ECGsystem, electrodes are affixed to specific parts of the chest ,arms, or hands and legs. Even though this promises highly accurate results, it often requires a great deal of preparation and an expert to attach the electrodes to the patient's body.These electrodes also require skin preparation and conduction gel to reduce contact impedance The main problem with this method is that it cannot be used for long-term measurement

Dry electrodes consist of a metal with no electrolyte or conductive gel between the electrode and the skin. Instead, sweat or moisture on the skin will reduce the impedance between the skin and the electrodes. Various applications have been proposed using the dry-electrode technique, but these required direct contact with the skin. Thus researchers have invented a noncontact or capacitive-coupled ECG. The capacitive-coupled ECG was first introduced by Lopez and Richardson Then, researchers expanded its use in various environments. Lim *et al.* and Yama *et al* developed a heart monitoring system in office chairs and mattresses using flexible fabric
electrodes. Leonhardt *et* introduced the idea of an insulated electrode implemented in a car system. Lee *et al.*
proposed the use of thin and flexible electrodes for a wearable ECG system to build a system that can measure an ECG in remote areas. Oehler *et al.* proposed an integrated 15-capacitive-electrode array and combined this array with a personal computer tabl

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III.OVERVIEW OF THE PROPOSED WORK

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A. INTRODUCTION

This section contain information about the fingertip sensor module used as the main component and the overall hardware descriptions. It is a promising method to measure an ECG in remote areas without inconveniencing or disturbing the user. The advantages of this technique are that it can measure an ECG without direct contact and provides better accuracy than other method. On the bsic background work of our work. It uses the wearable armband for the mobile ECG monitoring. Therefore, capacitive-coupled technology is used in the proposed system to overcome these problems. It is a promising method to measure an ECG in remote areas without inconveniencing or disturbing the user. The advantages of this technique are that it can measure an ECG without direct contact and provides better accuracy than other methods, especially for measuring stress. The proposed monitoring system is important for monitoring exercise intensity, estimation of maximal oxygen uptake and energy expenditure and early detection and in helping keep persons healthy by being able to track their heart activities at any time.

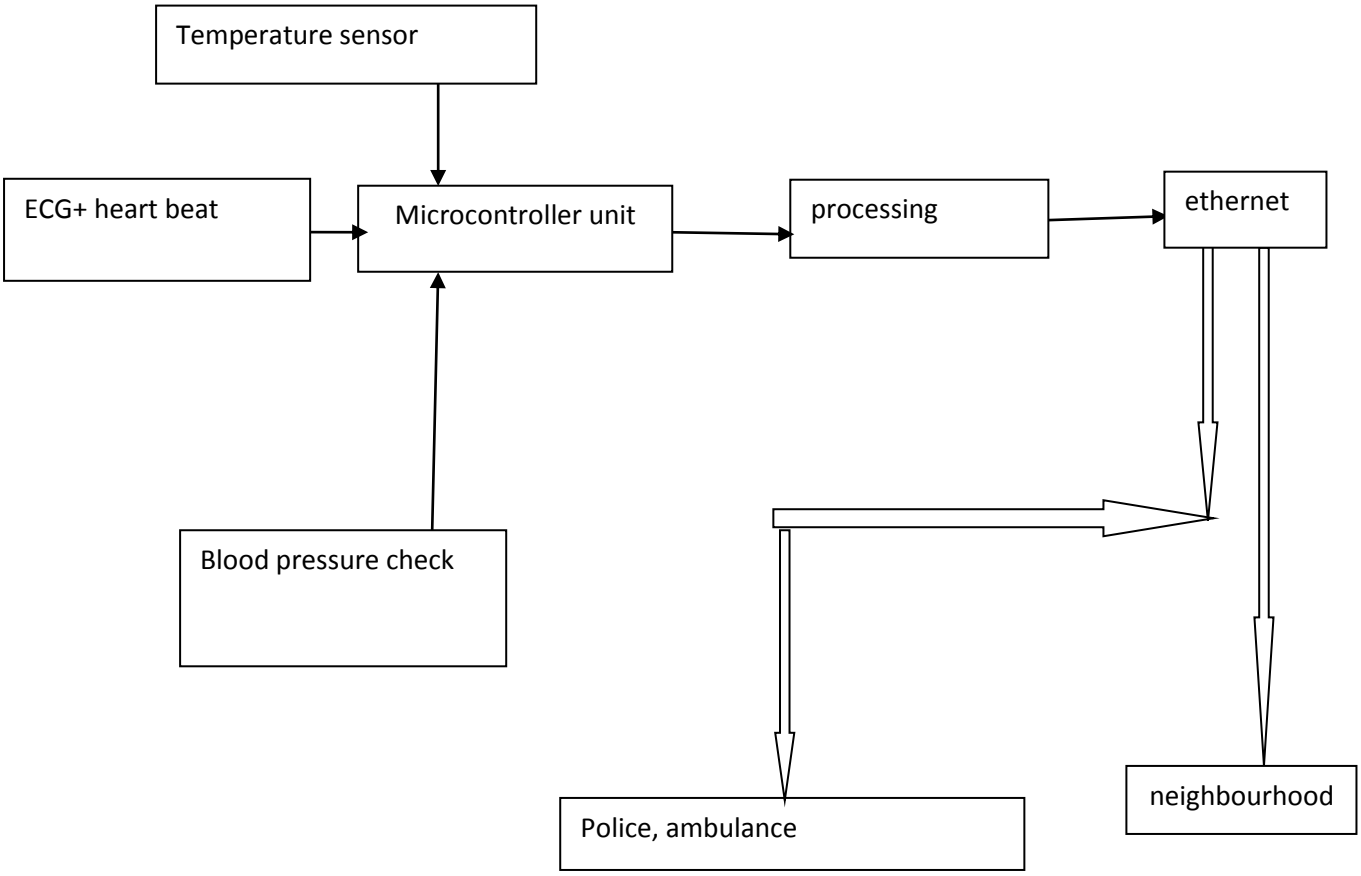
B.BASIC CONCEPT OF THESE WORK

We have to use these technology that will usable to detect the ECG signals of a patient without any hard electrode attachments. It uses a finger tip module that can detect the ECG signals and also here the heart beat, temperature measure also. Photophlythmograph technique using photons as the basic source introduce here. It also provides the sudden information of the patient condition to the hospital ambulance and police through anIOT system. Through these we can conclude the patient have to make a sudden attention that there may fever on his body. Then a blood pressure checking also done through these work. Finally we have to say that it is acloud of health monitoring. It requires reduced cost and make a together health condition checkups. Also the lonely living persons make more benefit to make sudden attention to the neighbourhood . We can g through the main units and can identify the real process.

C. DESIGN AND MODELLING

Below diagram showing the main conceptual units like micro controller, ethernet, temperature sensor, ECG heart beat sensor, etc. We have also there is the GPS unit raspberry pi module cloud server on the communication module. We can then expand them as possible way. It can have the improved versional concept of health monitoring model. Through lookin on the basic block we can explain the further processing.

Basic block diagram



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1 MICROCONTROLLER UNITS

Here we uses two types of microcontroller units. One for the detection of the temperature and ECG+ heart beat then conversion to the digital format and processing. The other for the remaining processing unit that making the signal storing and passes it to the IoT environment.

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

2 SENSERS

The sensors are temperature and pulse sensors.They are detect the analog quantities from the body and passes to the microcontroller unit. Bio-signals to analyze health conditions with a mobile device as an interface and an analysis device.

Heart beat sensor is designed to give digital output of heat beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

.3 GPS

It used to detect the position of the person who are in our consideration. So we have to helpful as reaching hospitality to him or her. Also calling police ambulance more speedly.

GPS Method of Operation

A GPS receiver calculates its position by carefully timing the signals sent by the constellation of GPS satellites high above the Earth. Each satellite continually transmits messages containing the time the message was sent, a precise orbit for the satellite sending the message (the ephemeris), and the general system health and rough orbits of all GPS satellites (the almanac). These signals travel at the speed of light through outer space, and slightly slower through the atmosphere

4 RASPBERRY PI

It is the main functional unit. In which the data aquasition and control taking. It connects the primary microcontroller cloud server, and the other units.

.5 CLOUD SERVER

It makes the system connectivity through world wide web. IoT makes the path efficiently.The process of information passing to the hospital, police and ambulance makes faster and accuratly. It have many branches in the wide range.

.6 WIFI

It uses the connection module or as the interface to the hospital, ambulace etc.

It is a communication protocol used in a range over area.

7 SD Card

These uses the serial data card which is the SPI line from Raspberry module. That is a bus interconnect wire. In these uses the SPI protocol also the technique used are multiple input single output (MISO) and multiple output single input (MOSI).

D. METHODOLOGY

It have some methods and featural concepts for the work in our consideration. We have to select first finger tip module and it can place to an appropriate person. The person is in our experimental consideration. The finger tip module consists of sensors and the technique used is photophlymography. Which means the photonic emission as when a light (flow of photons) emitt at the position of sensors then it travels through the blood in the body part, it is finger here. The received signal part consist of the information about the heart activity, that can be detect . The biological signal detected can be converted to the electrical signal through the microcontroller unit.

The further processing can be done through microcontroller unit.The values can be shown through signals and any change or rising in the biological signal can be noted. That is change in heart beat change in pulse also rise or decrease in temperature.

Then it can be share through an IoT interface, store the measures in SD card and pass through a WIFI network. The proposed monitoring system is important for monitoring exercise intensity, estimation of maximal oxygen uptake and energy expenditure and early detection and in helping keep persons healthy by being able to track their heart activities at any time.

Experiments were performed to evaluate the performance of the system. Hardware testing was presented to show the output signal of the proposed system in different scenarios.

The proposed application can show an ECG signal in real time on a graph and then analyze the data to make smart decisions. The proposed algorithm was tested on a PC to validate the system. The results indicate that the proposed heart rate calculation error rate is less than 10% compared with a standard system.

The whole system makes an advanced ECG measuring as well as the health monitoring package. Through these work there is a sudden information carrying process for the hospitality. We use the python IDE for the development process and a wide IoT technology.
Different placements would provide different shapes of the ECG signal; thus, they tried to find the best place from which to measure an ECG based on demand. We place the device as in the finger tip and make the signal as in the desired shape.There are many ways that we can place left or right arm finger as our need . The shapes of the waveform can make a better validation techniques for the completion of the our work

IV.SOFTWARE BACKGROUND

.1 PYTHON

It is a widely used high-level, general-purpose, interpreted, dynamic programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of codethan possible in languages such as C++ or Java. The language provides constructs intended to enable writing clear programs on both a small and large scale.

Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library

Python interpreters are available for many operating systems, allowing Python code to run on a wide variety of systems. Using third-party tools, such as Py2exe or Pyinstaller, Python code can be packaged into stand-alone executable programs for some of the most popular operating systems, so Python-based software can be distributed to, and used on, those environments with no need to install a Python interpreter.

C Python, the reference implementation of Python, is free and open-source software and has a community-based development model, as do nearly all of its variant implementations. CPython is managed by the non-profit Python Software Foundation.

4.1.1 STATEMENTS AND CONTROL FLOW

- The assignment statement (token '=', the equals sign). This operates differently than in traditional imperative programming languages, and this fundamental mechanism (including the nature of Python's version of *variables*) illuminates many other features of the language. Assignment in C, e.g., x = 2, translates to "typed variable name x receives a copy of numeric value 2".
- The (right-hand) value is copied into an allocated storage location for which the (left-hand) variable name is the symbolic address. The memory allocated to the variable is large enough (potentially quite large) for the declared type. In the simplest case of Python assignment, using the same example, x = 2, translates to "(generic) name x receives a reference to a separate, dynamically allocated object of numeric (int) type of value 2."
- This is termed *binding* the name to the object. Since the name's storage location doesn't *contain* the indicated value, it is improper to call it a *variable*. Names may be subsequently rebound at any time to objects of greatly varying types, including strings, procedures, complex objects with data and methods, etc.

V.RESULTS

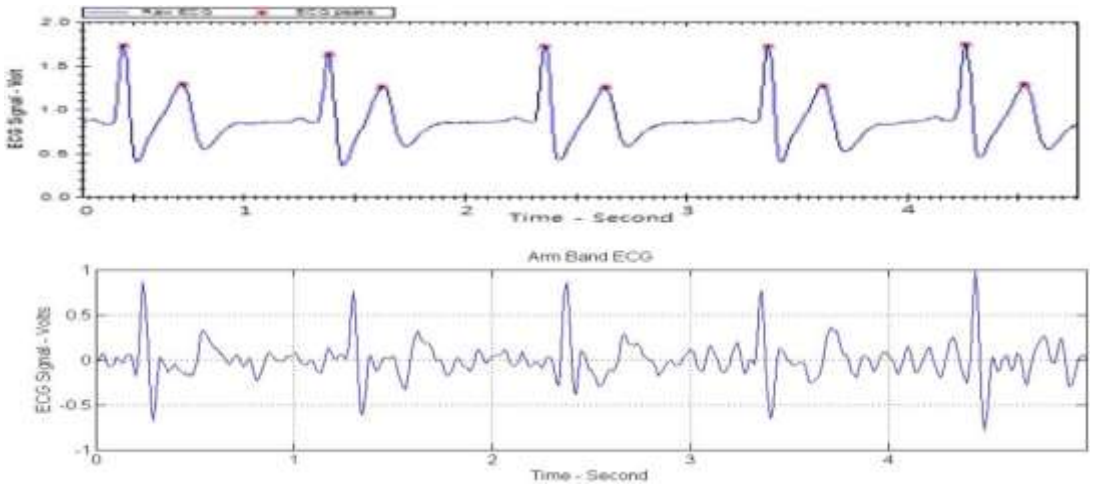
Our work will go through a favourable condition that human ECG signals can detect in an easy way.Also in remote area and the sudden informer to the hospital, police and ambulance. It can be done with an IoT enviornment also described below section.

We can also detect the persons temperature value that helps to know any fever to him/her.Other one is that to identify the persons heart beat value.

The patients blood pressure condition also checking there. They also together can store in an SD card .

The bio-signal that was measured in this system is an ECG signal. Although the ECG signal that is received from the arm is quite small, the proposed system was smart enough to overcome noise and detect useful information from the recorded signal.

The various ECG signal outputs are given below as cleared that we can obtain the various conditional ECG waveforms also the heart rate conditions. Here the results together gives the temperature and blood pressure out puts



Various ECG signal strengths

VI.CONCLUSION

A new wearable device for a healthcare monitoring system was proposed in this paper. The device was implemented in a finger tip to achieve a non-obstructive system. The finger tip was chosen as an alternative to previous wearable devices that are strapped to the chest, which can be inconvenient for some users. The technology used in this system uses photonic motion and it called as photophlymograph.

The bio-signal that was measured in this system is an ECG signal. Although the ECG signal that is received from the arm is quite small, the proposed system was smart enough to overcome noise and detect useful information from the recorded signal. Experiments were performed to evaluate the performance of the system. Hardware testing was presented to show the output signal of the proposed system in different scenarios. The results from these experiments show that the proposed system can still function even with different position and variations. The multitasking of our system will be a more benefit to the whole medical results.

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