



# Non-Invasive Blood Pressure and Temperature Monitoring Instrument Based Microcontroller

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## ABSTRACT

This design and development of a non-invasive method to measure the blood pressure signal and thermal temperature sensor in this instrument for remote monitoring and also continuous monitoring system based IOT module and microcontroller. The system is an embedded system and blood pressure is a biomedical signal measured using an optical device measurement continuously measure for a long period of time. Blood pressure numerical reading values of systolic and diastolic blood pressure calculated is then displayed on a mini-LCD as well as these data send through IOT module

## I. INTRODUCTION

Blood pressure (BP) is the pressure exerted by circulating blood upon the walls of blood vessels and Blood pressure (BP) is measurement of the force applied on the walls of artery vessels as heart pumps blood through the body. Moreover, blood pressure measurement is known as one of the vital signs and is widely used to monitor the physiological condition of human beings along with other vital Signs such as heart rate, breathing rate, oxygen saturation and temperature. Blood pressure can be seen a two variance first one is a systolic Blood pressure (SBP) and second one is diastolic Blood pressure (DBP), and systolic is the higher amplitude pressure on the walls of the arteries which happens when the ventricles of the heart are contracting. The measurements of Blood Pressure are of great importance because it is used for detection of hypertension (high blood pressure). Blood pressure is low means the value is below 114mmHg is called as low blood pressure, and the value of the blood pressure is high means the value is above 130mmHg is called as the high blood pressure and the normal resting blood pressure for adult is approximately 120/80mmHg. Non-invasive method divided two-way Auscultation/Auscultatory (Manual Cuff) and Oculometry. These

two non-invasive methods are generally accepted and widely used but they severely restrain patient's mobility, they require uncomfortable cuffs; they are not suitable for home to measure the BP and cannot be used for continuous long-time monitoring applications.

Continuous measurement of BP for homecare requires an accurate and inexpensive method that is independent from patient movement and does not require continuous care by a practitioner.

Normal human body temperature is the typical temperature range found in humans. The normal human body temperature range is typically stated as 36.5 – 37 degrees Celsius. Human body temperature varies it depends on gender, age, time of day, exertion level, health status, what part of the body the measurement is taken at, state of consciousness and emotions. Body temperature is kept in the normal range by thermoregulation, in which adjustment of temperature is triggered by the central nervous.

## EXISTING SYSTEM

Existing system work is to study the abnormalities in multiple biomedical parameters and to inform it to a caretaker using GSM communication network through SMS. The design of hardware and software for a compact, reliable and low-cost system to achieve remote monitoring is studied. In this system, monitoring of simulated biomedical parameters is implemented for simulated Blood Pressure & Body Temperature. In the event of any abnormalities, it alerts by messages on LCD display as well as sends SMS to Doctor's / Care taker's cell phone and buzzer is used alert the people around and to seek help from them.

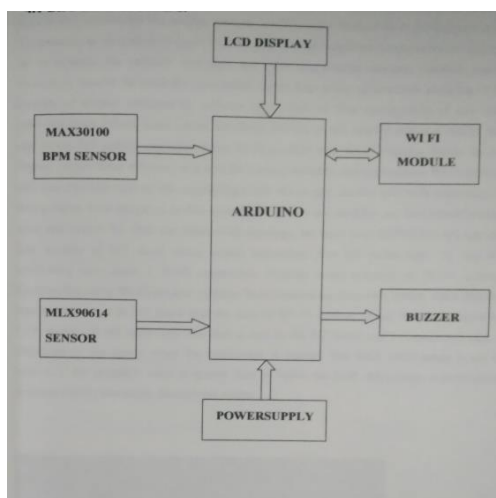
## PROPOSED SYSTEM

This Proposed system a non-invasive method to measure the blood pressure signal and



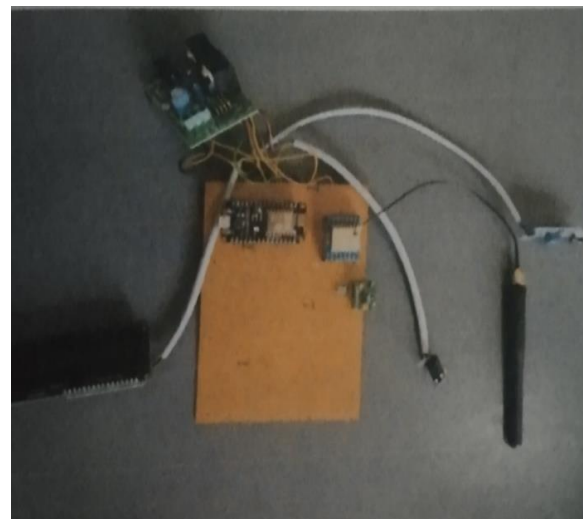
thermal temperature sensor in this instrument for remote monitoring and also continuous monitoring system based IOT module and microcontroller. The system is an embedded system and blood pressure is a biomedical signal measured using an optical device measurement continuously measure for a long period of time. Blood pressure numerical reading values of systolic and diastolic blood pressure calculated is then displayed on a mini-LCD as well as these data send through IOT module.

#### BLOCK DIAGRAM:



An IoT-based health observation system works on the patient's body observation system such as pulse rate and body temperature. Heartbeat device hooked up to the patient's fingers and temperature the sensing element is additionally hooked up to the patient's body. Temperature sensing element could be a sensing element supported resistance its resistance is set by dynamic the patient's vital sign, and pulse rate sensing element, vibration sensing element or flow in its price it's transmitted within the variety of associate signaling. 2 the quantity of sensors obtained by Arduino UNO, nice or wise management of this when receiving these values, these values are saved showed on the display and at a similar time sent to the IoT system exploitation the Wi-Fi module with Wi-Fi modules within the IoT display system these numbers area unit for various websites and applications Wi-Fi sources, and chat area unit used for this employing a web site or app, doctors will track pulse rate and their patients from anyplace. In this system two sensors are used for one heat sensor another heart rate sensor. To filter the details with drawings, we have used THINGSPEAK app and data transfer to IoT cloud using mobile technology

and IoT technology. To use this application user needs a Wi-Fi connection. Arduino board connects to Wi-Fi network functionality using Wi-Fi module. Arduino board learned sin from two senses. After that this installation is sent to IoT cloud with the help of Wi-Fi module. Rated inputs displayed on LCD screen. At the same time this data is sent to the IoT cloud and the measured data is displayed on the screen when the application is opened. The limit value range is set to system. If the available value is greater than or below the limit value range a notification message will be sent to the smartphone screen.



#### Hardware Requirements

- Arduino
- LCD Display
- BPM Sensor
- Wi Fi Module
- Thermal Sensor

#### Software Requirements

- Arduino IDE
- Embedded C

## II. CONCLUSION

The proposed patient health monitoring system can be used extensively in emergency conditions as they can be monitored daily, recorded and stored as a database. In the future IoT device can be integrated with computer computing so that the database can be shared across intensive care and treatment hospitals. And also, in this pandemic this health monitoring is very useful, we can avoid go to



hospital regularly in this pandemic and check our self in our house only.

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