

International Journal of Computer Science and Mobile Computing



A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IMPACT FACTOR: 6.199

IJCSMC, Vol. 8, Issue. 10, October 2019, pg.129 – 136

Health Monitoring System Using IoT and Data Analysis

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Abstract: In today's lifestyle, Health has become a serious issue which directly affects quality of LIFE of a person. Health problems like cardiac failure, high blood pressure and diabetic patient needs to monitor problem on regular basis. This paper is based on monitoring of a person's health condition automatically through sensors. Here, several sensors would be used for gathering the biological information of a person. Then, the information is forwarded to IOT. The system is more intelligent that can able to detect the critical condition of the patient. The analysis will be done on the data collected from patients of different age groups such as from 20-30, 30-40, 40-50 & so on. This data is represented in the graphical form. Graph will contain the data of different age group having average value of their biological information. And it will vary differently in Men and Women in each age group. This modern concept of monitoring the patient remotely will bring a major development in Medical arena.

INTRODUCTION

In present, Technology plays an important role in development of the human being .Such as IOT (Internet of Things), it refers to communicate between the devices in an efficient manner within a network. IOT gives a platform for the devices to dumb there data to IOT and provide a common language to communicate devices with each other. Data is emitted from various sensor's send to IOT platforms securely.

A health monitoring system can be used in every field such as detecting diseases like Blood pressure, Diabetes and Heart-related problems. In everyday life, diseases make a human being suffer physically and mentally. To avoid these kinds of diseases and to keep control on it, this

project was made with the help of IOT (Internet of Things) features. Internet plays an important role especially in field like business, education, science, and communication. The internet is the most powerful creation in History given by human being.



FIG. INTERNET OF THINGS

The data will be collected from a variety of person's and forwarded to Arduino through the sensors like Blood pressure sensors, diabetes sensors, and heart pulse sensors. The aims of this project is to help the rural/urban people to easily check their health on regular base. Also, the success of this project will encourage developers to build something more useful machines. Different sensors like diabetes, heart rate sensor, and BP sensor are used for monitoring the health condition which is integrated on Arduino and perform as a Single system. Differences in analysis of data can be noticed easily. This difference can save a person's life by taking a proper precaution in an instance of time. This would also help the patient's concern doctor to take suitable action. This system would play an important role in saving someone's and giving a proper guidance on health issues. If this project will be upgraded in future. For example, where a doctor has to check patient then the doctors or nurses will get information about the patient remotely without visiting the patient.

RELATED WORK

1. BONE MORPHOGENETIC PROTIEN 208 (BLOOD PRESSURE SENSOR)

Blood pressure is that the pressure of the blood within the pathways. The center deals and expands once it beats. Contraction pusher the blood through the pathways to the body, and this force creates pressure on the arteries. vital sign is measured as high vital sign and low vital sign that referred to as blood pressure (as the center beats) and also the blood pressure (as the heart

relaxes between beats). The unit that measures this can be referred to as a pressure gauge. vital sign that's too low is termed low-BP, and pressure that's systematically high high-BP. each have several causes and will be of fast onset or long period. Long cardiovascular disease (low-BP) may be a risk issue for several diseases, together with heart issues and urinary organ issues. Long cardiovascular disease (high-BP) is additional common than long cardiovascular disease.

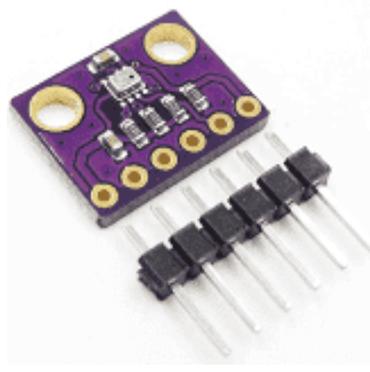


FIG: BMP208

There use the sensing element BMP208; The BMP280 Digital measuring system is developed by Hieronymus Bosch sensing element detective. Compared with the previous measuring system comes with a better performance and also the smallest size within the business. The BMP280 is associate absolute atmospheric pressure sensing element the sensing element module is housed in a very compact 8-pin metal-lid LGA package with a footprint of solely two.0x2.5mm² and 0.95mm package height. Its tiny dimensions and low power consumption. It supports 2 kinds of communication: I2C and SPI.

2. SPARKFUN soap 30105 (HEARTBEAT SENSOR)

A human body is functioning in an exceedingly heart. A body depends on the center. So, Heartbeat is outlined because the pulse of your heart, or one short moment acts as a unifying force. Once your heart pulses and pumps blood throughout your body, this can be referred to as a heartbeat.



FIG: SPARKFUN MAX30105

There used the sensing element SPARKFUN MAX30105; Spark Fun MAX30105 Particle sensing element may be a versatile, powerful sensing element sanctionative sensing of distance, heart rate, particle detection and even the blinking of a watch. The MAX30105 has been equipped with 3 LEDs yet as a awfully sensitive gauge boson detector. The concept is to pulse the various LEDs, then notice what shines back. Supported the mirrored signature it's doable to notice differing kinds of particles or materials (such as ventilated blood or smoke from a fire).

3. ONE bit aldose MONITOR (DIABETES SENSOR)

Diabetes might be a malady that happens once your aldohexose, jointly referred to as glucose, is just too high. aldohexose is your main offer of energy and comes from the food you eat. Enter, a secretion created by the secreter, helps aldose from food get into your cells to be used for energy.



FIG: ONETOUCH aldose MONITOR

There used the sensor OneTouch it is easy to use. It's sound alerts with color and audio alerts. It is an amount product, throughout this project we tend to tend to use for aldose observation by get its analogy values. (Fig. OneTouch aldose monitor) we tend to tend to use this one-touch amount product for getting the aldose level of the patients. We tend to tend to urge the analogy unit and power offer from there we tend to tend to urge the analogy to digital worth by Arduino

4. ARDUINO HARDWARE

- Arduino [2]

The Arduino Uno could also be powered via the USB affiliation or with degree external power offer. The power offer is chosen automatically. The Arduino Uno might be a microcontroller board based. External (non-USB) power can come either from degree AC-to-DC adapter (wall-wart) or battery. The adapter could also be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from battery could also be inserted among the Gnd and VIN pin headers of the power association.



FIG: ARDUINO

Features:

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
SRAM	2 KB (ATmega328)
EEPROM	1 KB (Atmega328)
DC Current per I/O Pin	40Ma

In this paper, mentioned through varied researches what development has been exhausted Patient Health observation System and our projected work concerning the next paper.

SYSTEM STYLE

• SYSTEM VOGUE

The design defines a full vogue and execution of the patient observation system. The mandatory sensors unit connected to degree Arduino Uno microcontroller. The Arduino microcontroller is connected with Arduino Uno. Arduino Uno associate degreed connected by associate alphanumeric display, the below style figure shown in fig. In our paper, we tend to propose the IoT based health observation for genetic defect patients. The common suggests that of observation is not compatible for all peoples, variety of peoples they are moving to a web world. So as that we tend to do this idea for a future execution. The doctor will monitor the patients by day to day observation. We tend to gather the health readings by the sensors that data all transmit into degree Arduino. The genetic defect, heart rate, pressure unita} sensors area unit connected into degree ARDUINO microcontroller for analogy to digital conversion. Which we tend to transmit the patient's data reading by a USB cable to Arduino. The Arduino contains all data collections and sends to the storage state card.

Proposed Work:

Aim of projected system to observe health of the folks mistreatment IOT devices and store the collected information on the IOT system. We've used associate Arduino (IOT development board) as a principal controller. The Arduino board collects patient health parameters from totally different sensors like pulse rate sensors, BP sensors, Diabetic that were directly connected with principal controller.

The parameter that square measure observe red and check the progress during this system square measure heart-beat pulse, glucose. There parameters square measure measured mistreatment Arduino. The analysis /data that is monitored by Arduino is show on the LCD mechanically by the IOT. Patient health standing are often determined simply. System is separated into hardware and software package section. Software package is liable for additional glorious operating of the system additionally for alliances. Each section add parallel method. Hardware is once more classes into transmitter section and receiver section .Execution of transmitter is vital half as a result of transmitter section is directly hooked up to the patient or individual.

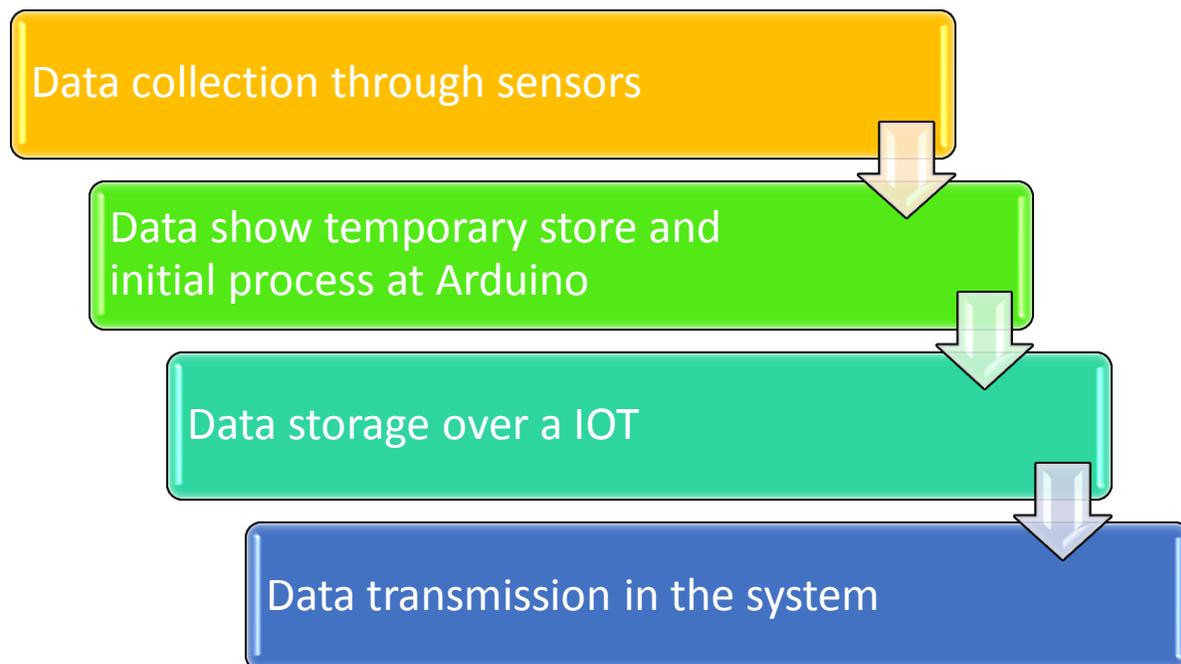


FIG. WORK-FLOW OF THE projected SYSTEM

As per the work flow opening move within the system is to gather information from patients through the sensors. Information have measure/ mention to health parameters of heart-rate, glucose, temperature. The sensors that collect information from patients on timely basis with this frequently acquire information the health condition of intense patient is determined and build necessary prescription square measure counseled.

The collected information is show on LCD screen connect with the Arduino board, if want for specific purpose the information is processed then send to IoT server for storage. From wherever it's approachable to need shopper within the applications and per the applying wished.

Conclusion:

Health observation system designed is predicated on investigator concept that meets to the patient's desires. As per thought of standard system, this method still in use from their producing however it's terribly large to handle individually and size and price {are additionally also are} additional compared to the advance system and also it take over one minute for obtaining the precise result.

As per the survey of our project a range of samples from the patient is taken. The framework is assessed tentatively and gather the instance info of ten patients to ascertain the standing of patient .The specialist will screen the advance of patient's upbeat the framework are often extended by adding additional parts to the moveable application like connecting the emergency vehicle administration, driving specialist summary.

We have analysed ARDUINO primarily based health observation system mistreatment IoT. Any abnormalities within the health conditions are often illustrious directly check our drawback and square measure hip to the actual person or doctor. The projected system is easy, power economical and straightforward to know. It acts as a connections between patients and doctor.

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