



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 3, March 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.512

9940 572 462

6381 907 438

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A Review on Health Monitoring Devices Using IOT

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ABSTRACT- A person's well-being is determined by one of the crucial factor called health. Better health care systems provide better quality of life and standards. But nowadays, the population is increasing and so as the rate of chronic diseases. This is a major problem for our society. It is very difficult for the doctor to be with patient 24 hours. Thus science and technology has once again paved a new path to overcome this situation and this was through the system of IoT. IoT provides a gateway medium where communication between devices is possible. It helps to connect and exchange data over the internet. Thus data transfer between the patient and doctor is possible even if they are both in different places. This paper, gives an overview about the multi-parameter patient monitoring system using IoT which helps to overcome the low healthcare systems in our society. Smart observance way that are enforced in this reasonably producing method, allows economical chase of system degradation in real time through acceptable devices. This paper discusses about the various systems using IoT especially in the health sector.

KEYWORDS – IoT (Internet of Things), smart health, SVM (Support Vector Machine), MPM (Multi-parameter patient monitoring).

I. INTRODUCTION

IoT (Internet of Things) is a widely used technology in recent years. This is because of its unique feature to connect various things through internet. It is a network of physical objects which aims in the connection and exchange of information to other devices. These things or objects are embedded with several sensors and software in it. The rising increase of IoT has taken place since the population is increasing and so as the people's needs and standard. The Internet of Medical Things (IoMT) is an associate degree application of the IoT for medical and health connected functions, information assortment and analysis for analysis, and observation. The IoMT has been documented as "Smart Healthcare" because the technology for making a digitized tending system, connecting offered medical resources and tending services. IoT devices may be accustomed change remote health observation and emergency notification systems.

The multi-parameter screens are intended to give number of data on one screen and thus gives various data that is expected to comprehend the patient condition. It has arisen as a screen to bring to the table adaptable answer for changing basic consideration need. They give a complete comprehension of patient by giving a more extensive observing degree. These screens give perusing, for example, pulse, focal venous pressing factor, non-intrusive circulatory strain, ECG, SpO₂, PaCO₂ and obtrusive circulatory strain and temperature. The screen has caution where the boundaries can be set and the parental figure will be alarmed for change past the set boundary. This paper discuss about the various systems using IoT, especially in the health sector.

II. LITERATURE SURVEY

A researcher [1] proposed an IoT based real time health monitoring system. The proposed system consists of the fundamental important sensors interfacing with the cloud and the mobile application. It uses the technology of IoT and other wireless detector techniques for economical health watching. It includes several sensors which captures the data and are processed in the arduino. The important parameters of the patient are acquired by attaching the device on the patient's body. The information from the sensors is taken at every 30 seconds and can be viewed on the webserver. If the sensing element values move equal or above of the threshold value, then an emergency alert is passed to the doctors within the mobile application through a Wi-Fi module and GSM module with the details of every sensing element. This information is then passed to the cloud for details changes of the previous information. The previous information is often accessed on the web site and therefore the information is stored within the cloud.

In this work [2] several researchers proposed a system to help the users to observe the patient from a distance without the necessity of any physical interaction and it allows a new methodology for virtual consultation. The sensors collect the data and are passed onto the microcontroller. The corresponding data are stored and displayed through online platform which helps to inform the doctor about the patient's emergency situations. In this way they also provide a way to inform the concerned family members of the patient before the emergency. The major limitation of this work was that it only senses 3 parameters of the patient's body. This makes the system more complicated to diagnose the patient's condition. Another work [3] suggested a method to install a low cost IoT sensor system. The planned system consists of a microcontroller, several sensors, GSM/GPRS module and one LED for the device fault detection. This system is used for the monitoring of the indoor parameters. The formed design relies on the micro service paradigm and adopts a 2G digital communication network.

Several researchers [4] proposed an idea about smart manufacturing which offers promising aspects of reliability, maintainability, smart monitoring methods and safety production process. The main goal of this project is to represent the most important steps to observe and assess the health state of the system. It's necessary to analyse the system to spot the important parts resulting in the system operation. It aims in the process of construction of health indicator. To develop the component's health state, current, vibration, force and torque measurements which are the foremost appropriate parameters to observe the health care process. The obtained results highlighted the strength of the projected health indicator no matter the in operation modes of the signal varieties. In this work [5], they discuss about the benefits of IoT in daily life and include comparison of algorithms. IoT is extensively utilized in all applications. IoT plays a significant role in linking the doctors to the patients by utilising health observation devices. IoT can be defined as a collective word which has sensors, processors and computers that are connected to its networks. Activities in daily life (ADL) is employed to spot the constraints of the patients or the aged people. The health care suppliers wished to supply an answer patients at low value while not perturbing the comfortable lives. The patients can reside home doing their daily activities and also simultaneously be monitored by the devices that it offers updates of their health conditions to their doctors.

In this paper [6], a researcher proposed an idea about the improvements in the wireless networking technology. Wireless Body Area Network (WBAN) offers several applications within the remote health observation and drugs. It permits the combination of intelligent and miniaturized device nodes in or on somebody's body to observe the physique functions. It helps in the collection crucial data which include temperature, pulse rate, oxygen saturation, ECG and blood pressure of the patient.

Location of the coronary illness [7] by utilizing Computer Aided Diagnosis framework was troublesome. A profoundly proficient strategy for the identification of sickness dependent on ECG signals through Support Vector Machine (SVM). At beginning phase, recognize the cardiovascular issue proficiently. In some cases Doctors may set aside any longer effort for finding, But with the assistance of PC supported framework utilizing forefront innovation it will make extremely Quick. Utilizing support vector machine effectively distinguish the sickness at beginning phase with high exactness rate. The keen home [8] is intended to improve the idea of the Internet of Things (IoT) into our home climate.



It interfaces electrical items and family products to the organization, and afterward screens and controls them. It likewise saves the expense of HR conservation, which incorporates the opening and shutting of entryways and windows, the beginning and halting of engines, the association and interference of the framework, at that point use Support Vector Machine(SVM) calculation to characterize and fabricate models. The executed model is applied to our shrewd home framework lastly confirm the accuracy.

Perhaps the most well-known indoor situating innovation is Wi-Fi based finger impression [9]. A web of things (IoT) helped unique finger impression indoor situating framework utilizing support vector machine has been proposed. The help vectors grouping with portion stunts are acquainted with achieve multi-classes arrangement issue in unique mark indoor situating. The outcomes show support vector classifier with Gaussian RBF bit work has most elevated situating precision.

A researcher [10] proposed an idea of combining the multiple features for enhancing the performance of multi-parameter patient monitor. Multi-parameter patient monitors(MPM) are generally utilized for checking basic physiological imperative signs, for example, pulse, oxygen immersion, circulatory strain and breath rate. In the proposed system she built up a pattern MPM utilizing Support Vector Machine(SVM) backend classifier utilizing Radial Basis Function (RBF) portion with four imperative signs as its information. There consistently exists a natural connection between the imperative boundaries. To catch this natural relationship between the four boundaries, the correlation features (CFs) were utilized which was determined by taking the mathematical mean of two sets of imperative signs. The straight SVM classifier model form with these highlights shows an extensive improvement in the MPM framework. Another paper [11] proposes a health monitoring system (HMS) in view of another arrangement technique comprising of the on-going real time support vector machines (RTSVM). The new HMS signified by RTSVM-MS manages issues of observing frameworks in emergency unit. The fundamental point of this new framework is to significantly diminish the pace of bogus alerts and keep a high and stable degree of affectability. Moreover, it defeats the primary issue of the current HMS by proposing an order model that thinks about the variety of the patient states over the long run.

Also, the limits set must be changed when patients are improving. Notwithstanding, edges are steady and don't decipher the conditions of patients after some time since, all current frameworks in ICU don't consider of the patient's states development. Our proposition can create an underlying model that orders conditions of patients to ordinary and strange (basic) utilizing the LASVM. At that point, it refreshes its model by considering the advancement in the conditions of patients utilizing RTSVM. Subsequently, the new framework gives what the clinical staff needs as data and alerts comparative with observed patient. Fundamental sign screens [12] and ventilator/sedation workstations are furnished with various cautions to improve patient security. A high number of bogus alerts can prompt a "falsely sounding the alarm" marvel with sequentially disregarded basic circumstances. Methodical information on alert examples and thickness in the perioperative stage is absent. The target of this investigation was to portray the examples of disturbing of a financially accessible patient screen and a ventilator/sedation workstation during elective heart medical procedure. They played out an imminent, observational investigation in 25 successive elective heart medical procedure patients. Altogether patients, indistinguishably fixed alert settings were utilized. All approaching patient information and all alerts from the patient screen and the sedative workstation were carefully recorded. Also, the sedation working environment was recorded from 2 unique points to permit review explanation and connection of cautions with the clinical circumstance and evaluation of the anaesthesiologist's response to the alerts.

III. CONCLUSION

Currently we are facing the global pandemic situation called COVID'19 and its been hard for the patients to visit their doctors during this lockdown hours. Thus the health monitoring device using IoT helps in resolving this problem. With this new technology, people will be able to know their health issues even at their residence and do not need to visit the doctor regularly for checkup. This device is very helpful for the elderly people as well as the people who have chronic diseases. It uses wireless sensor technology. The device ensures the complete safety of the patients and informs them as



well as the doctors at the same time of their current health situations. And if necessary, it will notify them about the emergency or the abnormal conditions of their health. Thus by using this device it helps to improve the quality of life.

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