

Cardio Monitoring and Cardiac disease Prediction Using Machine Learning

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Abstract

Heart disease is the biggest cause of death in the globe. The method of predicting cardiac disease and monitoring is exceedingly complex. It can only be done properly if the doctor has a lot of expertise and is well-versed in the condition. IoT-based illness prediction is a relatively recent technology for accurately classifying diseases based on sensor data. This system proposes an enhanced deep learning-based framework for predicting the heart disease. The general publicly available Hungarian heart disease dataset is utilized for the implementation, which includes heart disease related data collected from patients through IoT sensor devices. The body sensor networks is one of the core technologies of IoT developments in health care system. IoT and GSM based monitoring system is proposed for continuous monitoring of patient's health condition using different sensors. The Internet of Things (IoT) with smartphone technologies contains vast applications in solving the problems of heart diseases in patients needing care. With wireless sensors and smart devices, remote monitoring can identify the real-time physical status of heart patients during normal physical activities. Doctor can monitor the patient condition on his/her smart phone.

Keywords: IoT, sensor data, body sensor networks, health care system, GSM monitoring, wireless sensors, remote monitoring.

1. INTRODUCTION

In our daily lives, healthcare is really important. With good therapy, health disorders can be diagonalized and prevented at an early stage. Various curing equipment such as CT, MRI, PET, and others can quickly identify problems present inside our bodies or beneath the skin. Furthermore, certain unusual disorders, such as heart attack and heart stroke, can be easily prevented in their early stages. Due to the massive rise in the world's population, there is an unpredictable spread of degenerative illness in a large number of people, causing a problem for modern health-care systems, and the demand for money for everything from hospital beds to doctors and nurses is at an all-time high. It is necessary to lessen the strain on healthcare systems in order to keep the standard and quality of care given at the highest possible level. The Internet of Things (IoT) may be a viable option for lowering heart-related stress [1,2]. The IoT is a broad term that refers to network devices' ability to detect and gather data from the world around us, and then transmit that data across the Internet, where it may be analyzed and used for a variety of interesting purposes. The IoT in healthcare is playing an increasingly important role in monitoring and diagnosing health-related issues.

1.1. WIRELESS SENSOR NETWORK

A wireless sensor network (WSN) is a computer network consisting of spatially distributed autonomous devices using sensors to cooperatively monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion

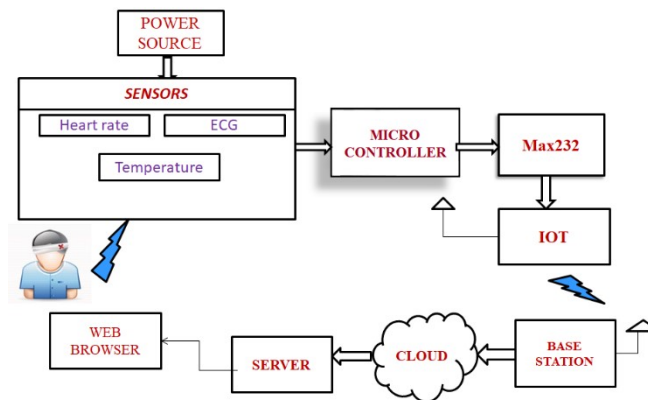
1.2. Area monitoring

Area monitoring is a typical application of WSNs. In area monitoring, the WSN is deployed over a

region where some phenomenon is to be monitored. As an example, a large quantity of sensor nodes could be deployed over a battlefield to detect enemy intrusion instead of using landmines. When the sensors detect the event being monitored (heat, pressure, sound, light, electro-magnetic field, vibration, etc), the event needs to be reported to one of the base stations, which can take appropriate action (e.g., send a message on the internet or to a satellite). Depending on the exact application, different objective functions will require different data propagation strategies, depending on things such as need for real-time response, redundancy of the data (which can be tackled via data aggregation techniques), need for security, etc..

2. METHOD

In existing system all the sensors data will be stored send to the doctor using Zigbee. A Wireless Sensor Network (WSN) for monitoring patient’s physiological conditions continuously using Zigbee. Here the physiological conditions of the patient's are monitored by sensors and the output of these sensors is transmitted via Zigbee and the same has to be sent to the remote wireless monitor for acquiring the observed patient’s physiological signal Infusion pump is a medical device. It is healthcare facilities used worldwide in hospitals, and at home. It can deliver fluids both in medicines and nutrients such as pain relievers chemotherapy drugs, hormones or insulin, and antibiotics into a patient’s body in any amounts. There are many types of pumps including insulin pumps, syringe, large volume, elastomeric, patient-controlled analgesia (PCA), and enteral pump. Enteral pump is a pump that is used to deliver medications and liquid nutrients to a patient’s digestive tract. Patient-controlled analgesia (PCA) pump is a pump that is used to deliver pain medication. Insulin pump is a pump that is used to deliver insulin to patients with diabetes which is frequently used in home. These devices are very important for nurses because they can show status of liquid that they give to patients. So, the devices are very popular in hospitals for checking status of medicine.



In the proposed system, Internet Of Things (IOT) with mobile phone technology has various application in reducing the issues of cardiac disease in patients. Through wireless (ECG, heart beat and temperature) sensors and wearable smart devices, remote monitoring can identify give the results in immediate physical status of heart patients during normal activities. The IoT technology monitors the patients health and log the data in a cloud storage. Health monitoring of the people in the society is becoming the difficult issue nowadays, because they could not bother about their health status. So, that there are many IOT devices now days to monitor the health of patient through internet. Doctors are also taking measure of these smart devices to keep an eye on their patients. In this work, we will make an IOT based health monitoring method to saves the patient heart beat rate and it also send an email/SMS to the required neighbor for the information of patients. They can immediately give recover treatment to the patient to save their life. Authorized persons only access the database. It is used in military, sports and individual purpose. Low cost and wireless The IoT technology use internet to transfer the medical data about the patient continuously. Body Sensor

Network (BSN) allows the integration of intelligent, miniaturized low-power sensor nodes in, on or around human body to monitor body functions and the surrounding environment.

3. RESULTS AND DISCUSSION

3.1. Results

We found that even though most of the popular BSN based research projects acknowledge the issue of the security, but they fail to embed strong security services that could be preserve patient privacy.

3.2. Discussion

MySQL deployments are required to provide improved performance and reliability. A typical high-end configuration can include a powerful master database which handles data write operations and is replicated to multiple slaves that handle all read operations.[18] The master server synchronizes continually with its slaves so in the event of failure a slave can be promoted to become the new master, minimizing downtime. Further improvements in performance can be achieved by caching the results from database queries in memory using memcached, or breaking down a database into smaller chunks called shards which can be spread across a number of distributed server clusters.

4. CONCLUSION

We found that even though most of the popular BSN based research projects acknowledge the issue of the security, but they fail to embed strong security services that could be preserve patient privacy. Finally, we proposed a secure IoT based healthcare system using BSN, called BSN-Care, which can efficiently accomplish various security requirements of the BSN based healthcare system. All the sensor which is connected in the body is used to collect the normal symptoms of the human body and then it is collected back to the doctors through the IOT technology.

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