Smart Priority Based Recommendation System for Elderly Patients

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ABSTRACT: Recommendation system are becoming more popular and emerging technology in recent trends for solving society problems. Recommendation system is subclass of data mining technique. The priority based recommendation system is developed for elderly people in their emergency cases. Elderly people need more attention in their health issues, requires more care even after the treatment is over in hospital. Proposed system is to improve the recommendation services after reaching home from hospital in terms of feedback. Proposed system provide healthcare services for elderly people with recommendation and feedbacks. Recommendation is provided based on their heart rate and blood pressure value. Here by using user based prediction system data is collected from smart band used in hospital for patient monitoring. System composes details of vital signs (blood pressure, heart beat) of elderly people. The system provide recommendation for elderly people with accuracy and performance for health their environment. Variation in band determines the emergency of patients.

KEYWORDS: Recommendation system,Smart band, Patient monitoring, Prediction

I. INTRODUCTION

The wireless sensor network is a trigonous network used to intuit or monitor the environment. The wireless sensor network needs both wired and wireless connection for transferring data. To hook the data prosperously on the network is reliability. Reliability is considered important factor in networks. Wireless sensor network is constructed by cluster of sensor nodes and huge sensors they are latched each other by protocols and algorithms. The sensor node with the small size is characterized by the battery with a tiny capacity, the restricted use of energy, the limited data processing capability. In today's life every human is responsible to takes care of their health. In the present scenario, the appellation wireless body area network is an intrinsic part of humans' routine life due its array of applications, especially in the tract of healthcare systems. Wireless body area networks (WBAN) include a collation of body sensor nodes that are trifling power and light-weight devices which are either frayed on the body or insinuate inside the body. The architecture of wireless body area network three different tiers namely, Tier-1 as Intra-BAN, Tier-2 as Inter-BAN, and Tier-3 as Extra-BAN [2].

The Tier-1, the body sensor nodes collect the data and send to the coordinator.Tier-2, the cocoordinator process the received data and sends information towards the sink node. Tier-3, from the sink node the packets are transmitted to the doctors and concerned authorities, using the internet or other communication techniques in (Fig 1.1).
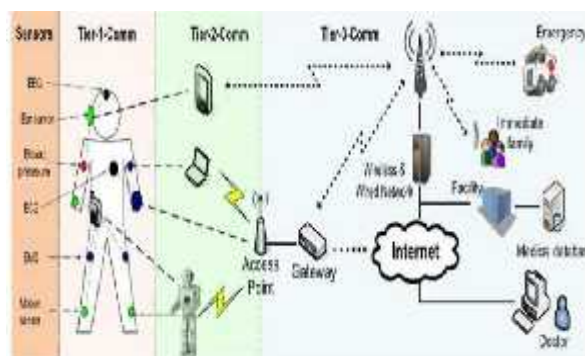
Fig 1.1 Block diagram of WBAN

In order to identify the important metrics that have to be considered in wireless body area network (WBAN) during the design process, a general overview about the routing challenges in wireless body area network should be studied. The certain routing issues and challenges include network topology, postural movements hat while implementing the whole wireless body area network.

The network lifetime that defines the following metrics: Network lifetime, defines that the sink node is dead. Path loss means between the source node and last node the transmitted power is adrifted. Stability period is the time before the first node when it dies. Residual energy is the difference between fledging energy and cast-off energy during the operation of the network. Packet delivery ratio is determined by crew of packets sustained at sink node to the crew of packets consign from the source.

A new spawning of wireless sensor network is enabled due its rapid growth of technology accumulating less power and high surveillance of battery usages. Applications are used in many areas like agriculture, industrial, and healthcare monitoring system. The body area network field is a multidisciplinary area and monitoring continuously with actual time rejuvenates of anamnesis or medical history over the web. A number of physiological sensors can be insinuated into a wearable wireless body area network, which can be used for early detection of medical conditions. The insinuated sensors in the human body will collect various physiological changes in order to overseer the sick person well-being status no matter their location[1].The information is passed wirelessly through any kind of devices like smart phones. By using this gear it can siphon all the tidings to doctors. If an emergency is detected, messages or alarms are sending prosperously on through the internet by physicians or by monitoring systems. Currently the level of information provided and energy resources capable of powering the sensors are limiting.

The objective of this paper is when an accident occurred the information is passed to emergency medical service and concerned authorities at correct time. After that person's heartbeat, temperature and blood pressure is measured.

A. Organization of this paper

The remainder of this paper is organized as follows. In Section II, the literature review is discussed and summarized followed by the findings in section III. Whereas conclusion is presented in section V.

II. LITERATURE REVIEW

From [1] Health monitoring system is efficient one but needs to detect health conditions in time and make diagnoses according to the gleaned data. ECG monitoring is a widely studied and applied approach to diagnosing diseases. However, wireless ECG monitoring system doesn't work without a mobile application. Within the cloud

system, medical data are collected and transmitted automatically to doctors, physicians or caretakers from anywhere and feedback is given to patients.

This method for ECG monitoring based on Cypress Wireless Internet Connectivity for Embedded Devices (WICED) Internet of Things (IoT) platform. The wearable monitoring node will sense the data and it transmits to the cloud using Wi- Fi. The protocols can provide sufficient data rates for transmitting ECG signals with satisfying power consumption. Due to the limited communications ranges of Bluetooth and ZigBee, a smart terminal is usually needed to receive the ECG data and then send the data to the IoT cloud through the Wi-Fi.

The real world and digital world bridge are established by the IoT. In the cloud, the device object is connected and unique identification is created over the internet. The IoT cloud is responsible for visualizing the ECG data to users and storing these valuable data for further analysis implemented on servers such as the HTTP server, MQTT server, and storage server. Internet of Things utilizes open source protocols like CoAP/HTTP, MQTT, TLS/TCP, DTLS/UDP and OMALWM2M for data communication and device management.

From [2] Traffic accidents are happened due to the road infrastructure and advent of technology. The mortality rates are increased due to the message is not indicated at the proper time.

The demonstrated project uses Wreck Watch formal model for accident detection uses built-in microphones on a Smartphone to detect high-decibel acoustic events indicative of an accident. The other sensor is used in vehicle can precisely know that whether the damage is for vehicle or person. In an emergency, Wreck Watch allows people will give the information about accident spot. In particular, it allows bystanders and uninjured victims to take pictures using their smart phones The Wreck Watch server uses digital portable branch exchange (PBX) module to make a phone call from that fellow member interact with emergency retort via traditional circuit-switched networks and create accident information hotlines in response to serious accidents via an Asterisk-based digital PBX. The information is send to the fellow member emergency contact may be audio or text message.

The accident spot is identified properly it enables to reduce death rate. In vehicle accident detection and notification can use many sensors but a star sensor will work fast works with greater speed and the information is passed correct time to a family. However, it is an expensive system and it is not available to all the vehicles.

From [3] an accident occurs for the person the message was sent to the emergency medical service but it takes some time. In the demonstrated project an automatic alarm device for traffic accidents is introduced. If any accident occurs unexpectedly, the information is passed correct time and accident place is identified by the GPS. In GPS software the latitude and longitude information is known by satellite and then it will send to the centralized server. Then the server will search the nearest hospital and send the accident information to the hospital.

Once the information is gathered the hospital can send the ambulance to the respective accident zone. An ambulance is sent quickly to the accident zone. The distance is calculated by the k- nearest neighbor algorithm (KNN) is a method classifying an object based on the trained dataset. The k-nearest neighbor algorithm is one of the simplest algorithms in machine learning. The k- variable is assigned as 1, the object is nearest neighbor. The k-nearest neighbor algorithm is the modest algorithm and objects are assigned nearest or closest to its distance. An automatic alarm device for traffic accidents is introduced and achieved. If the accident occurred alarm sounds shortly so the wastage of time is reduced instead of searching and also save the time.

From [4] among the panoply of applications, healthcare is one of the most important features of every fellow. The sensor is latched on every fellow collecting the huge information than analyzing the health status and predicting mental status. Captured on a continual basis, aggregated and effectively mined such information can bring about an affirmative mutation changes in their user health. The treatment is given properly based on their health status. Using the app individual fellow health is maintained and able to reduce the amount but the internet is required.

Wearable sensors particularly those equipped with IoT intelligence offers attractive options for monitoring the fellow continuously and collecting their data in any environment either in a home or working place. This treasure trove of data is mined and broached to caretakers in easy-to- assimilate visualizations has the potential for radically improving healthcare and reducing costs.

From [5] Person health is monitored continuously when they travel on road and the status is updated to the transport office. The sensor monitors some attributes like heartbeat rate, body temperature, etc...The sensor values information is processed and given to Raspberry pi using the wireless technologies. In mobile phones using the application of healthcare can know the health issues of person easily and using the sensors identifies crucial situation. The sensor collects the values continuously any changes in values, details are communicated to transport office using networks. Transport office takes necessary action using GPS location and provides an ambulance service. If any serious problem occurred, transport office allocates other drivers.

III. PROPOSED SYSTEM

By heuristic approach in the accident case, the sensor will automatically send the message or an alert is sent to the police, emergency medical service, police, and authorities. One of the sensors the trivial accelerometer automatically detects the accident. In mobile phone having GPS and in-built impact sensor. The sensor automatically detects a vehicular accident and gives alert to the police, emergency medical services, and concerned authorities. It transmits vehicle id, number of passengers and geographical location of concerned authorities. The alert may be an audio message like MMS or a text message is like SMS. Before reaching a hospital in an ambulance having the device to check out the location which hospital is near.

Raspberry Pi or Arduino is a master device in the novel system; all the other devices like different sensors are connected to it. A DC power supply is provided for working of raspberry pi. IoT based patient monitoring System is a Raspberry Pi based system which collects patient's information with the help of few sensors. It uses Wi-Fi module to communicate this information to the internet. Temperature and heartbeat monitor module is threadbare by user and lashed to the system.

IoT server is attached to the system; it allows the connectivity for data exchange with other devices. IoT allows connected objects to identify and control remote access across a network. The output of temperature sensor and heartbeat sensor is displayed on LCD at user end too. The output of ECG is sent to the receiver or doctor end. All the information is first acquired, processed and stored in the memory of raspberry pi or Arduino. The stored information is then transferred to the receiver by means of IoT server.

5.2.3 Alert to EMS and authorities

The sensor will give messages to police, EMS and families or close relatives. By using this novel approach EMS arrival will be quicker. At some point mortality rate will be decreases.

5.2.4 Using Arduino and Raspberry pi

The Raspberry pi extended model raspberry pi 3 is used. The combination of these raspberry models is used for many applications. It is more powerful processor and it will be faster than other Raspberry pi models.

5.2.5 Monitoring Heart rate

Patient can be monitored continuously by the sensor. If any critical situations, that is suppose heart

5.2.6 Monitoring Temperature

The DHT11 sensor is a temperature sensor and it is very cheap compared to other sensors.

5.2.7 Message sends as an alert

Patient can be monitored continuously by the

Easy pulse used for measure heartbeat and DIY heartbeat sensor because just put finger inside it measured cardio vascular wave form. The latest version of Easy pulse is used in the project. Infrared rays are passed on the finger and photo detector on other side to measured variation in the transmitted light due to change blood volume inside the tissue.
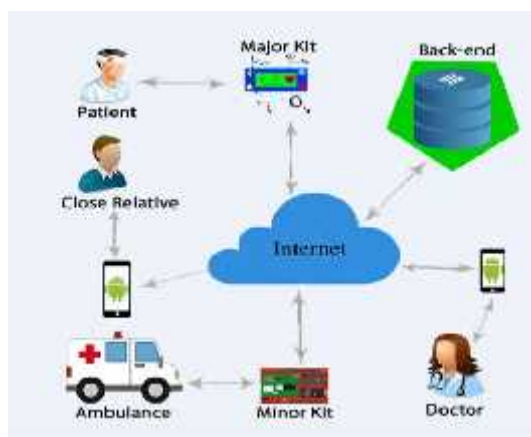

Fig 4.1: Architecture Diagram

IV. MODULE DESCRIPTION

Mainly novel approach is focusing on vehicular accident. The accident will be occurred at any unexpected state. If the accident occurred, information is not passed at correct time. Due to this reason arrival of emergency medical service is being delayed. By these reason mortality rate is increased. So using this integrated sensor with mobile phones accident cases will be recriminated by sensor.

5.2.2 Tracking the location

If the accident is occurred information is send (Fig.5.1). But need to know that when and where the accident happens. The mobile phone in GPS is used to track a vehicular location. If the vehicular location is known then ambulance can reach an accident spot.

V. CONCLUSION

After an accident needs to measure a heart rate, temperature and blood pressure for the patients. By monitoring the patients continuously using the sensor any changes happened it will be sensed quickly to doctors before caregivers. Doctors are not able to come and text message is sent to the doctor. If the accident occurs people was not given the message properly so by using my system can save the time and life of the people. If any abnormal value is sensed by the sensor alarm sound is given correctly.

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