

Smart Ambulance System with Patient Healthcare and alert System

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ABSTRACT

Patient healthcare provision in the home environment presents many challenges. Patient Healthcare is a term used for the practice of medicine and public health supported by mobile devices. It is most commonly used in the references to using mobile communication devices such as mobile phones, tablet & computer PDAs. A wireless sensor network with a large number of sensor nodes can be used as an effective tool for gathering data in healthcare situations. It is an autonomous sensor to monitor the physical or environmental condition. This project addresses Patient Healthcare System at home. The purpose of this project is to on emergency case doctor can handle the situation using this device. After analysing these patient records from device then doctor send the all details via SMS to the patient like prescription, tablets etc., and patient take action on this update and take a relax.

Keywords: Predictive monitoring, Wearable sensors, Personalized monitoring Microcontroller.

ARTICLE INFO

Article History

Received: 2nd December 2017

Received in revised form :

2nd December 2017

Accepted: 4th December 2017

Published online :

5th December 2017

I. INTRODUCTION

The monitor of the patients in the hospital are ambulatory and they are well suited to be monitored using wearable sensors for the purpose of predictive care. The goal of such system is to provide early warning of physiological corrupt so that preventative clinical action may be taken to improve patient's outcome health is one of the global challenges for humanity. World health organization (WHO) has mentioned that proper health is the fundamental right for an individual. People who are healthy, don't need to spend money for medicines and in hospitals and they secure income. They reduce burden on over populated clinics, hospitals and reduce workload of medical professionals. So to keep people fit and healthy proper healthcare services should be provided.

Despite wearable patients' monitors now being manufactured allowing the collection of physiological data from ambulatory patients that resulting in quantity of data acquired each day. This results in data deluge effect. The workload of clinicians and healthcare workers is high. This prevents them to inspect multivariate patient's physiological data to high degree of accuracy. Hence the predictive accept to patients monitoring is lost. Intelligent online processing

of this large datasets is required for predictive monitoring of the results which should then focus on the limited resources of human experts to these analytical data to those subsets of patients who require the expert review.

II. LITERATURE SURVEY

"Monitoring Mobile Patients Using Predictive Analysis By Data From Wearable Sensors, International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT) – 2016".

In this paper, system uses sensors, the data acquisition unit, microcontroller (i.e. Arduino) and software. This system is able to send the alarm messages or emails to doctors or stakeholders. This messages or reports includes the patient's critical health data. By using this information the doctors or healthcare professional can provide necessary medical advising. (1)

"Study on Mobile Healthcare System, International Journal of Advanced Research in Computer Science and

Software Engineering, 2014”.

Monitors the location based rapid search for patients. Mainly, performance related issues are focused. The privacy related issues are focused which provides the authenticated usage by cryptographic mechanism and provable data security. The strong privacy preserving schemes are analysed which provides the efficient e-health system by providing privacy and security. (2)

“Data Mining for Wearable Sensors in Health Monitoring Systems: A Review of Recent Trends and Challenges, Center for Applied Autonomous Sensor Systems, Orebro University, SE-70182, Orebro, Sweden; 2013”.

This paper provides a recent review of the latest methods and algorithms used to analyse data from wearable sensors used for physiological monitoring of vital signs in healthcare services. In particular, the paper outlines the more common data mining tasks that have been applied such as anomaly detection, prediction and decision making when considering in particular continuous time series measurements. (3)

“Mobile Healthcare System using NFC Technology, IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 3, No 3, May 2012”.

This paper use the Near Field Communication (NFC) as the basic architecture for m- healthcare. This facilitate the provision of healthcare facility to people anywhere, anytime using mobile devices which are connected through wireless communication technologies. (4)

“Mobile based Primary Health Care System for Rural India , Mobile Computing and Wireless Networks, CDAC, Electronics city, 2008”.

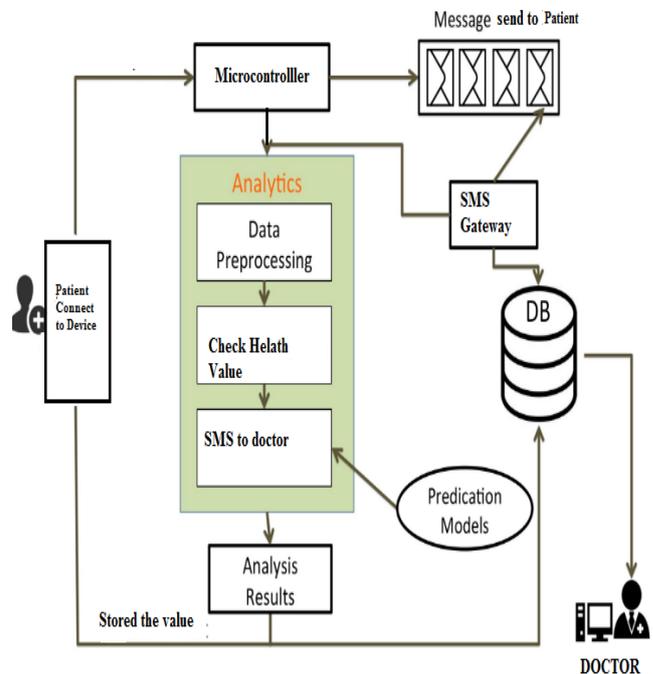
This paper talks about the shortfalls in primary health care system in India in comparison with the present status of Mobile healthcare systems in different countries. Also, this paper explores the potential solution to fill it with the enablement of Mobile Web technologies for Primary Health Care management. (5)

“A survey on wearable sensor-based systems for health monitoring and prognosis, IEEE Trans. Syst., Man, Cybern. C, Appl. Rev., vol. 40, no. 1, pp. 1–12, Jan. 2010.”

This paper attempts to review the current research and development on wearable biosensor systems for health monitoring of patients. A variety of system implementations are compared in a process to identify the technological shortcomings of the current state-of-the-art in wearable biosensor solutions. An emphasis is given to multi parameter physiological sensing system designs. This is providing reliable vital signs measurements and incorporating real-time decision support for early detection of symptoms or context awareness. In order to evaluate the maturity level of the wearable health-monitoring systems, a set of significant features, that best describe the functionality and the characteristics of the systems, has been

selected to derive a thorough study. In this survey focus is given to provide direction for the future research improvement. (6).

III. PROPOSED SYSTEM



IV. MATHEMATICAL MODEL

System Description:

Input:

Function Health Calculation ()

P : Patient

D : Doctor

S: Sensors

M : Microcontroller

V : Value of Patient health

Output:

When Patient connect to the device then automatically calculated patient health.

Input

Function SMS (id, request, data)

ID : unique id for each patient.

Request : Doctor send request to patient.

Data : Doctor input text data.

Output: Doctor send SMS in case of patient emergency.

Success Conditions: Success when system sends correct value to the doctor

Failure Conditions: Our system fails when no any result found to the given input.

V. METHODOLOGY

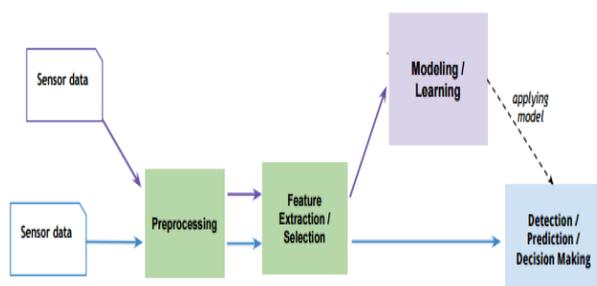


Fig2. A generic architecture of the main data mining approach for wearable sensor data

In the fig.2, the raw sensor data is typically used as a starting point of the data mining approach. Here, the sensor data is provided for 1. Training data system in order to learn the system and make a model of features. 2. Testing data system for real-world usage designed model and make the result out of it. This data mining approach is suggested as a general flow for both supervised and unsupervised data mining solutions. So that the data mining task can provide any kind of result.

The main steps of the data mining approach consist of following steps.

1. Data pre-processing
2. Feature extraction and selection
3. Modelling data learning the input features (considering expert knowledge and metadata)
4. Perform the tasks such as detection, prediction and decision making

VI. CONCLUSION

The proposed system is cost efficient and can be reached to lower economic class patients as it contains light weight sensors which are used to monitor the patients continuously and provide the proper messages to doctors and medical staff periodically and in emergency. Thus this system helps in saving life of the patient in case of abnormal conditions. A dynamic integration related to multimedia medical data provides the framework which is low overhead and rich multimedia support. The wireless medium develops a wireless emergency healthcare system for an environment that integrates with several technologies such as Microcontroller, Sensors and SMS.

REFERENCES

- [1]. Xu Wang¹, Jian Liu²;¹ “Design and Implementation for Ambulance Route Search Based on the Internet of Things”, School of Communication and Information Engineering University of Electronic and Technology of China (UESTC), Chengdu 611731, China.
- [2]. Rajalakhshmi. S S. Nikilla” Real Time Health Monitoring System using Arduino” Department of ECE, Sri Krishna College of Engineering and Technology Coimbatore, Tamilnadu, India.

[3]. R.Kumar “AN IOT BASED PATIENT MONITORING SYSTEM USING RASPBERRY PI” PG Scholar Department of Electronics and Communication Engineering, Kalasalingam University Tamilnadu, India kumarrcpm@gmail.com.

[4]. Sanjana. K.R, Shri Lavanya, y. Bevish linila, “An Approach on Automated Rescue System with Intelligent Traffic Lights for Emergency Services”.2015.

[5]. S.Pradeep Kumar, D.Akash, K.Murali, R.Shriram “Call Ambulance Smart Elderly Monitoring System With Nearest Ambulance Detection Using Android And Bluetooth”2016.

[6]. Kahtan Aziz, Saed Tarapiah, Salah Haj Ismail ” Smart Real-Time Healthcare Monitoring and Tracking System using GSM/GPS Technologies”,2016.

[7]. D. Suresh P. Alli “An Overview of Research Issues in the Modern Healthcare Monitoring System Design using Wireless Body area Network”.

[8]. Srijani Mukherjee, Koustabh Dolui, Soumya Kanti Datta “*Patient HealthManagement System using e-Health Monitoring Architecture*”.

[9]. André G. Ferreira, Duarte Fernandes, Sérgio Branco, João L. Monteiro, André P. Catarino, Ana M. Rocha “A Smart Wearable System for Sudden Infant Death Syndrome Monitoring ”.