DESIGN OF IoT BASED SMART

STRETCHER

FOR MONITORING MOBILE PATIENTS

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ABSTRACT

The Objective of this project is to save human lives by providing medical assistance and monitoring the vital parameters of the patient by smart stretcher. These data are processed and communicated to the nearby hospital; clinical aspects of the patient are identified before reaching the hospital. Patient identification is done with the help of bio-metric sensor which is linked with aadhaar and the patient information is sent to nearby police station, which enables them to contact the relatives. The manual operation of the stretcher is replaced with an automatic mechanism driven by a motor which reduces man power. The key contribution of this project is to facilitate medical treatments to the patients before arriving the hospital, since this system is developed by using affordable technology and merging different functions to offer a pragmatic solution.

Keyword : - *Hospital Stretcher, Smart Stretcher, Patient Monitoring , Arduino, IoT, Health Parameters*

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1. INTRODUCTION

Health is one of the global challenges for humanity. In the last decade the healthcare has drawn considerable amount of attention. The prime goal was to develop a reliable patient monitoring system so that the healthcare professionals can monitor the patients, who are either hospitalized or executing their normal daily life activities. Recently, the patient monitoring systems is one of the major advancements because of its improved technology. Currently, there is need for a modernized approach. In the traditional approach the healthcare professionals play the major role. They need to visit the patient's ward for necessary diagnosis and advising. There are two basic problems associated with this approach. Firstly, the healthcare professionals must be present on site of the patient all the time and secondly, the patient remains admitted in a hospital, bedside biomedical instruments, for a period of time. In order to solve these two problems, the patients are given knowledge and information about disease diagnosis and prevention. Secondly, a reliable and readily available patient monitoring system (PMS) is required. In order to improve the above condition, we can make use of technology in a smarter way

1.1 Literature Survey

Numerous techniques for controlling Direct Current (DC) motors have been proposed in [1].The system is prepared for tracking patients critical events and for evaluating medical scores automatically and in real-time in

[2]. A review of the recent literature shows predominantly positive results of Health Information Technology in [3]. A voice controlled motorized wheelchair with real time obstacle avoidance is designed and implemented in [4]. Principles of Health Interoperability HL7 and SNOMED provides a clear introduction to these standards, explaining the core principles for the health IT professional, student, clinician and healthcare manager in [5].[6] deals with a robust sliding-mode trajectory tracking controller, fornonholonomic wheeled mobile robots and its experimental evaluation by the implementation in an intelligent wheelchair.From the literature survey studied, we conclude that the system has certain deficiencies. The present stretcher does not contain any patient health monitoring sensors implemented in it and it is not available for unconscious patients. It is necessary to update live status of patients to doctor in nearby hospital. These above paper proposals give rise to the idea of integrating the stretcher system with monitoring sensors through microcontroller and the use of IoT for sharing information. Thus the expensive methodologies involved in existing system is made cheaper and also make light weight and portable by using these ideas suggested in creating this design.

1.2 Existing System

Based on the survey, till now, even hospital aide informs the live status of patient, there is no any smart system to inform patients live condition to nursing home through online. Also it is must to inform immediately about accident to relatives and police station to proceed legal activities. To overcome these issues, we are proposing an idea to implement a smart system in stretcher in ambulance itself. In existing, it is also noted that minimum two workers are required to push stretcher safely. The proposed system will help to overcome this problem also. Drawbacks are there is no automated system for information sharing and time delay to begin treatment.

2. PROPOSED SYSTEM

The Smart stretcher is integrated with medical intelligence system to transmit data with internet of things this can reduce time and prevent death due to time delay before reaching hospital. The proposed system consists of two sections namely stretcher section and hospital section. In stretcher section, there are many health monitoring sensors to monitor patient live health parameters that are implemented in stretcher. This information is updated to hospital via server for every second. Also it is necessary to inform about accident and patient personal details to nearby police station along with location.

Health monitoring sensors are implemented in stretcher itself and used tomonitor patient live health parameters. The information obtained from these sensors is updated to hospital via server for every second. Also it is necessary to inform about accident and patient personal details to nearby police station along with location. For this, a biometric sensor is used to get patient personal information. This information is updated to hospital and police station through Internet of Things. With this information, an alert will be messaged to patient's relatives by cop. Second section is hospital section. After reaching hospital, it is must to admit the patient in intensive care unit as soon as possible. But there are many obstacles that may interfere between entrance and care unit. Till now, hospital workers move the stretcher manually. It may take some time delay due to applying human power. To solve this issue, a stretcher control mechanism is implemented in this system which is controlled by microcontroller. By initiating this mechanism, stretcher moves automatically by stretcher moving mechanism with guidance of human. If the stretcher moves very fast or uncontrollable, then an emergency stop switch will be activated automatically to stop litter. A sonic humidifier sensor is implemented to detect whether any person or other object interferes in stretcher path. If any interfere occurs, alerting system is activated to avoid such interferes.
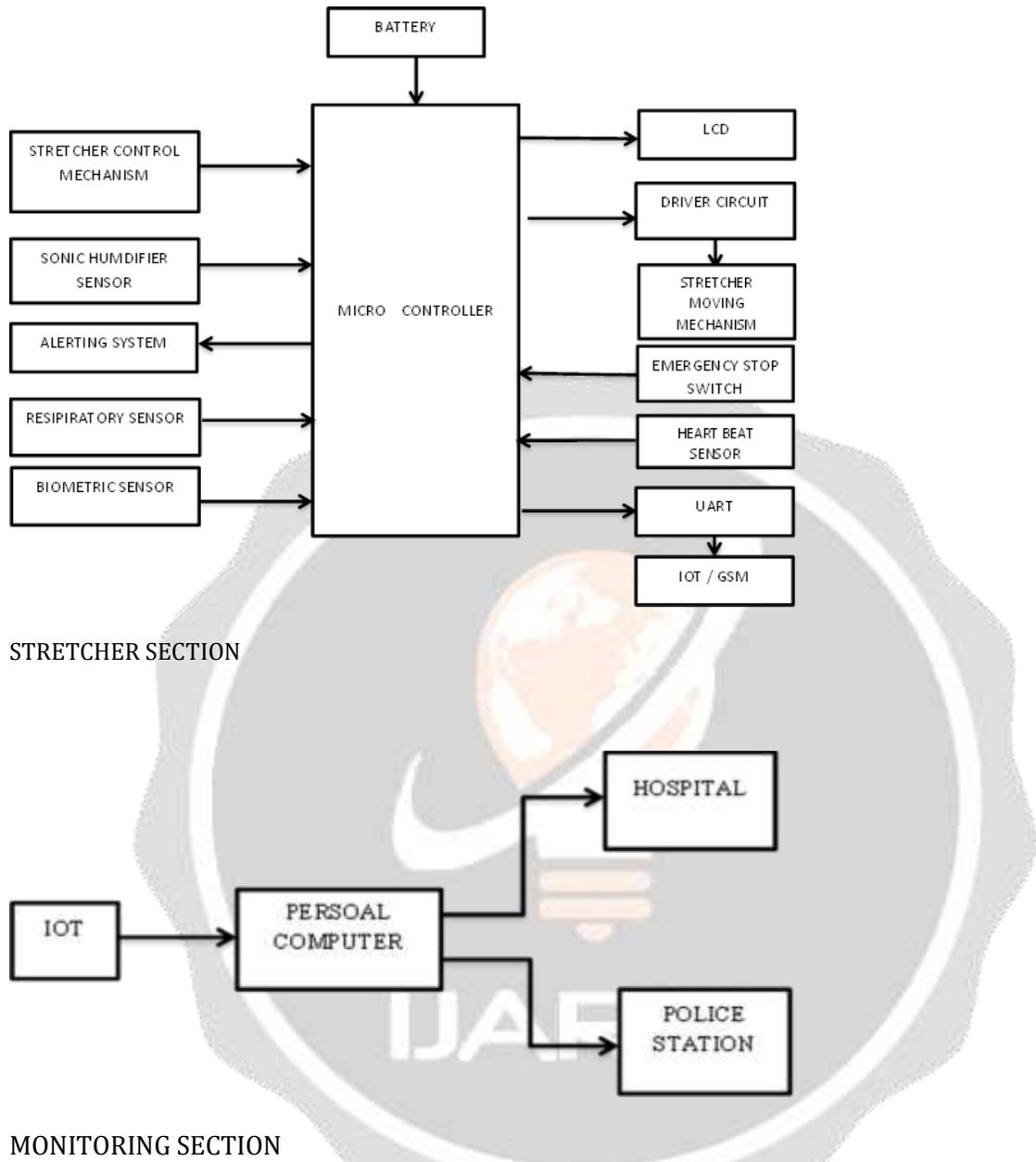
STRETCHER SECTION

MONITORING SECTION

Fig -1 SMART STRETCHER BLOCK DIAGRAM

Fig -2 SMART STRETCHER

3. CONCLUSIONS

This design reduces the delay that takes place between the time of picking up patient to setting up the arrangements in ICU for the treatment. This is done by updating information of patient live health conditions to hospital via server for every second. It is necessary to inform about accident and patient personal details to nearby police station along with location. This design also identifies the person by using fingerprint identification system and sends the information to both police station and nearby hospital through Internet of Things. To avoid delay occurring due to moving stretcher manually by workers, a stretcher moving mechanism is developed. To alert the path in the mobility of stretcher in hospital, an alerting system using sonic humidifier sensor is installed. These technologies present in this project are most robust, safe, efficient. They are much cheaper and well advanced than existing systems.

4. REFERENCES

[1] Flores, M., Pozo, N. "Comparative study for DC motor position controllers", IEEE Second Ecuador Technical Chapters Meeting (ETCM), October 2017.

[2] Portela, F., Santos, M., Silva, Á., Machado, J., Abelha, A., Rua, F.: Pervasive and Intelligent Decision Support in Intensive Medicine – The Complete Picture. In Springer, ed. : Lecture Notes in Computer Science (LNCS) - Information Technology in Bio- and Medical Informatics, vol. 8649, pp.87-102 (2014)

[3] Buntin, M. B., Burke, M. F., Hoaglin, M. C., & Blumenthal, D. The benefits of health information technology: a review of the recent literature shows predominantly positive results. Health affairs, 30(3), 464-471, 2011.

[4] O. Babri, et al., "Voice controlled motorized wheelchair with real time obstacle avoidance," ICCIT, 2012 Obtenido de: http://www.taibahu.edu.sa/iccit/allICCITpapers/pdf/p724-babri.pdf. [consultado: 13-Jun-2012].

[5] Benson, T. Principles of health interoperability HL7 and SNOMED 2010, (p. 263). London:: Springer.

[6] R. Solea, et al., "Sliding mode control for trajectory tracking of an intelligent wheelchair," University of Galati, vol. 32, no. 2, pp. 42-50, 2009.