

IoT Based Paralysis Patient Healthcare Monitoring System

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Abstract- *That early detection for paralysis is very difficult because many people and most of the paralytic patients are dependent on care takers. A paralysis is a disorder in which there is weakness of one or more muscles in the body. To better allow the people to help themselves, the use of their fingers in this proposed system is a break through innovation the patient is made to wear the sensor glove, and given that the movements of the fingers are read by the computer, the patient is recognized as bending their finger. Measures were put in place to ensure that early signs of ALS can be converted into audio to be understood by the patient. If the same operation is repeated thrice, indicating that the requirement is not yet fulfilled, the device will send a text message to the concerned care taker with the aid of GSM module and wifi module (IOT). In addition to wearing a patient-worn sensor glove, you must also monitor your home appliance remotely. In addition to this, the device tracks the patient's heart rate and body temperature to make sure they are stable. If the body temperature and heartbeat of the patient reaches normal values, then the buzzer will be programmed to indicate the abnormal values with respect to the patient, so the care taker can take care of the patient.*

Keywords- Paralysis, Risk Prediction, Patients.

I. INTRODUCTION

Paralysis is the lack of the ability to move — or a condition in which you do not really feel pain — in part or most of a person. The effects of this disorder may be transient or permanent. The rate of recovery of a patient's condition often varies from person to person. In order to determine the cause of paralysis, there are several issues. Causes include spinal cord injury, stroke of some kind, and multiple sclerosis. Paralysis is due to injury or disease(s) affecting the central nervous system (brain as well as spinal cord) which interrupts the nerve signals that are sent to the muscles. This could result in any one of the following conditions: complete loss of movement or weakness of a limb on one side of the body, complete loss or weakening of both legs, complete loss of movement or weakness of both arms, complete loss of movement or weakness of both limbs on one side of the body,

coma, etc. It is possible, and common, to have a side effect of paralysis and involuntary urination or defecation, as well. These days most the paralysed patients are either supervised by a paid attendant or are left alone to be taken care of. Some patients may be left without treatment by the Attendant or Caretaker, which can lead to a disturbance in mental/physical health. This research work focuses on developing equipment and electronic devices that will help with the patient's needs and also with the way the patient will interact with society and within their environment.

II. RELATED WORKS

[1] Health services are very critical, and if not functioning well can affect the economy, and can also affect the public health immensely. In this quick pace of life, it is difficult for people to be continuously available for their close ones who may need them when they are suffering from the difficult. The patient monitoring device measures the patient's physiological characteristics either continuously or at a daily period of time. A recent survey of world health association reported a staggering 5.6 million people were paralysed, reflecting a staggering 1.9 percent of the total population, roughly 1 in 50. Studies show that health monitoring of the paralysed in the hospital can show that there are many solutions, such as stimulation, medications that must be used to make sure they are healthy. It has also not been thought that there is any specific screening system to track the medical conditions of the paralysed. In order to combat these issues, a surveillance system is put in place, which is used to verify the patients' health conditions. In this monitoring device, there are bio sensors that calculate critical parameters such as the rate of the electrical heart and blood pressure and these parameters are monitored continuously and the control node transmitted the message to the caretaker by using GSM. This can be processed with microcontroller designs (MSP430). The fact that more and more elderly people are being born is another trend that's quickly becoming more prominent. According to estimates, the number of elderly people is expected to increase to a total of ten million in the coming decade. One of the main problems concerning the elderly and sick population is simply how to slow down and balance the developmental growth and

economic growth to keep any health issues that might arise under control. Older residents of the community need a significant percentage of health-service infrastructures due to various health concerns. Integrating smart buildings and cities could make it easy to fend for one's needs and enable seniors to live in settings customised to their profiles. There has been a recent development called the Internet of Things (IoT) which provides the capability to mix the smart world and a home together. Sensors are located in the world and measure all the data and make smart decisions. In the smart cities, a government and a private organisation will share a goal for providing the citizens a quality life and basic needs of life as well as health monitoring services[1],[3],[4]. Various pillars that govern smart cities are depicted in Figure 1. It helps the users get real time accurate information from the selected sources at the right time. For animal monitoring, an animal biometrics system works very well to track the animal, which uses highly accurate DNA identification[6] [7]. Another good idea is the "Healthiness" system, which of which is a system whereby it monitors of status of patients by capturing the voice and video through sensors mounted in the smart home. The speech is processed by using a hybrid system of feature detectors that can be modified with other backbones, and features derived from video by using additional video component analysis[8]. Smart cities and homes have many benefits but there is still a lot of work to do for data protection. An idea to provide a smart health system with data protection is proposed by [10] [11]. This health monitoring system uses various communication tools like the combination of different applications, objects (sensors and devices) as well as people. The device built in the animal is connected to multiple parts in order to control, track, and store the information of the animal in order to take care of its health The data is pulled from the mobile devices using a protected watermark that identifies "John Doe". A large amount of data is produced from IoT in cities that are designed to be smart [12]. Smart cities are difficult to create because they have Difficulty dealing with the consistency and efficiency of the data. However, in physics research there exists an energy efficient algorithm that is defined in [13]. The "friendly" systems in smart cities can be deployed to world continuously track the voice and communication of citizens and to notify them upon the risk of voice degradation which will prepare them for damage control situations. According to the medical dictionary [14], dysphonia is a problem in speaking, typically evidence of an alteration of the voice. Hoarseness may be used to describe a variation in voice quality as interpreted by self or others. Voice samples could be obtained in a variety of locations, ranging from public academic institutions, to public courts, to parks and shrubbery[15],[16]. Many that have a high likelihoods chance of voice disorders should be tested at daily appointed times, and a precautionary campaign can be

initiated to warn them of voice disorders. People who work in occupations that require a lot of voice use, such as teachers, singers, customer service representatives, and judges, have a high risk of suffering from voice complications [15], [16]. Along with back ground noise, people employed in the stock market as well as with prolonged back ground noise can also suffer from voice problems. For blind people, speech recognition isn't perfect, but still gets a lot better each year [17].

When the voice does not come out properly, it is possible that the voice will falter due to problems with the two muscular layers in the larynx region. Research has shown that a nerve that regulates your voice can be weakened if you've been in a car accident, worked in a factory, or even a fall into concrete will damage it[19]-[12]. The air pressure produced from the lungs vibrates the vocal folds, which produces the voice. Similar to how a humming or singing bird's vocal folds are influenced by irregular tissue growth on the surface, the same is true for a humming or singing human. Due to problem on the surface of vocal folds, they exhibit irregular vibrations which created hoarseness, breathiness and harshness in a voice of a person. Unless otherwise noted the voice condition could be found in any one of the age groups. This is because people (patients) will see the general hospital as a long wait and a rush. Moreover, the dependence on family members may be the reason that many people do not seek help for mental health problems early enough. In the case of delay or ignorance, treatment by incision of vocal folds becomes important when there are voice disorders that are cancerous, and if they are severe, as the one described above [14]. In order to prevent life-threatening voice disorders, it is very important to have early diagnosis of voice disorders and be able to determine whether it is happening by using machine learning techniques. With the use of automated systems, a person can assess his/her voice even if he/she is not physically in the hospitals. In theory, anyone who has voice disorder may be "predicted" with an automated voice identification device. In the article They sound; in the article Ali et al. [22] used different frequency bands in an automated method to decide their contribution in differentiating the usual and disordered subjects. The speaker as well claim that Pouchoulin et al. [23] and Fraile et al. [24] noticed several different issues detecting the existence of an altered speech pattern. It is relatively easy to build a detection device by using sustained vowel as a speech signal only moves and stays stationary during the phonation of the sustained vowel. Every form of acoustic analysis, short- and long-term, may be used to analyse the sustained vowel sound. There have been several studies that have used the short-term acoustic analysis such as Mel-frequency Cepstral Coefficients (MFCC) [25]–[31] and LP coefficients, and long-term acoustic parameters such as

shimmer, jitter, fundamental frequency, and formants [36]–[38] to measure e-cigarette speech level and quality. The above also states, however, that running speech is more accurate than the artificial phonation of continuous vowel as people use running speech in everyday life conversation. The speech includes numerous characteristics which are monumental for the assessment of the voice quality, including voice breaks, voice onset and offset details and voice establishment. These vocal features are not completely exhibited with sustained vowels (e.g., "a", "e", "o", "u")(t). Both of these cost features are often accompanied by the fact that the moving speech can not easily be detected. We did not have all of the data necessary to draw a definite conclusion on the matter, so we will conduct more research. Using a set of four-year historical records a prediction model can be created which will have an accuracy of 86 percent. Short term respiration analysis is a more preferable alternative, due to the overall variation of respiration over time. (as opposed to the features of the acoustic analysis). Since this first publication, a small number of studies have established the running speech intruding the voice disorder detection system. The majority of the work for "Hip-Hop" was performed by him. In a survey learn to IOT based Patient Health Monitoring system, the author's name is Amitabha Chakrabarty(25MAR.2018), the Conference/Journal is International Research Journal of Engineering and Technology. (The IRJET Journal). The advantages are that electronic devices have been used to enhance the health of patients. In the survey it was learned that the title of the paper was Arduino Based Heart Rate Monitoring And Heart Attack Detection System, the author of the paper is Bandana Mallick. January 9, 2016. International Journal of Science, Engineering and Technology Research is a scientific/engineering journal. This is the IJSETR. the benefit is the ability to react faster.

For a study on an IOT patient monitoring system, the addition of a "smarter" patient management system is the only way. To learn more, the name of the author is Narasimha Rao Jasti Madhu (MAY.2018) The conference/papers is the International Journal of Pure and Applied Mathematics. IJ Puzzle (IJPAM). To increase it, nicotine substitutes are positive. In the survey they learned that in the paper titled "Sensor Based Wearable System to Assist Paralytic Patient with Continuous Health Monitoring" by Kumara K R , author (MAR. 2017) The DOI for the journal is International Journal on Future Revolution in Computer Science & Communication Engineering. The post-award. (P/A: E) Obtaining an advantage is real-time. During our fieldwork, we come across hospitals and health organisations treating paralytic patients who are left paralysed due to the Paralysis Attack. These people in most cases are not able to express their needs since they are not able to communicate properly nor do they convey

by sign language due to failure in motor control by their brain. Via the care taking skill of the programme the person will ensure the prompt introduction of the patient to the care-taking process and the person can receive the care-taking help that helps to maintain a healthy health. The system someone has developed allows patients to be mobile inside their surroundings by using mobile telecom devices and portable kits that they can hold. The developed device features a breathed in impingement sensor to measure the patients pulse (rapid heartbeat if needed); an impingement sensor to measure the room temperature (in case of emergency); and a vibration sensor to detect emergencies.

III. EXISTING SYSTEM

Patients that have their entire or partial body disabled by the Paralysis attack, often results in deterioration of the human mind/body condition and these people in most cases are not able to express their needs since they are not able to communicate properly nor do they convey by sign language due to failure in motor control by their brain. The patient monitoring device measures the patient's physiological characteristics either continuously or at a daily period of time. A recent survey of world health association reported a staggering 5.6 million people were paralyzed, reflecting a staggering 1.9 percent of the total population, roughly 1 in 50. Studies show that health monitoring of the paralyzed in the hospital can show that there are many solutions, such as stimulation, medications that must be used to make sure they are healthy. It has also not been thought that there is any specific screening system to track the medical conditions of the paralyzed. In order to combat these issues, a surveillance system is put in place, which is used to verify the patients' health conditions. In this monitoring device, there are bio sensors that calculate critical parameters such as the rate of the electrical heart and blood pressure and these parameters are monitored continuously and the control node transmitted the message to the caretaker by using GSM. This can be processed with microcontroller designs (MSP430). The fact that more and more elderly people are being born is another trend that's quickly becoming more prominent.

IV. PROPOSED SYSTEM

Our suggested solution of the method is to help a person adjust to life with paralysis by being able to live an independent life, reduced to the extent possible by staying physically as independent as possible. Large and costly devices like the ones used in e-cigarettes could contribute to some potential addiction because they hold a lot of highly addictive chemicals. They are only available to patients at hospitals, making them inconvenient to use at a patient's home

or in an office at their convenience. We propose a device, which is mainly composed of a transmitter and a receiver part. (seeking an explanation of flux sensor or gyroscope... "In addition to the sensors that are mounted in the wireless transmitter section, a flux sensor or gyroscope will be placed on the finger of the patient. thus, the precision of the wireless system is increased.") This gyroscope is capable of measuring the static acceleration of the system due to gravity, so it can accurately determine the amount it is tilted off the earth's centre. Whenever a patient feels like asking for assistance, he tilts the gyroscope in various directions. This is a gyroscope with the purpose of converting the rotation of the device to torque, and the other side is the output to the controller board that uses the torque as input for the processor. The Wi-Fi transceiver is used for transmitting and receiving a signal that aids the GSM unit for counting the condition of the patient. The heart beat sensor and temperature sensor are used to show the patient's heart beat and temp.

COMPONENTS USED

HARDWARE REQUIREMENTS

- Arduino uno
- Power supply
- Accelerometer sensor
- Temperature sensor
- Pulse sensor
- LCD display
- GSM module
- WIFI module
- buzzer

SOFTWARE REQUIREMENTS

- Arduino IDE

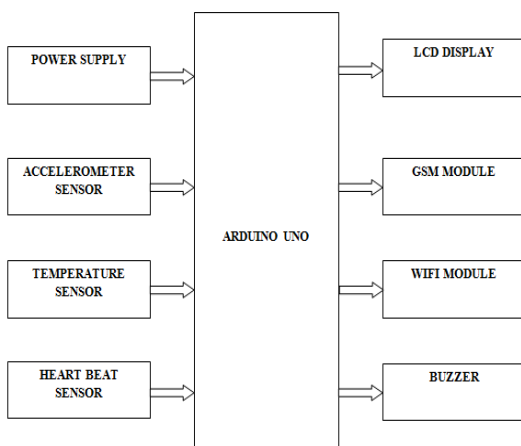


Fig 1 block diagram of proposed

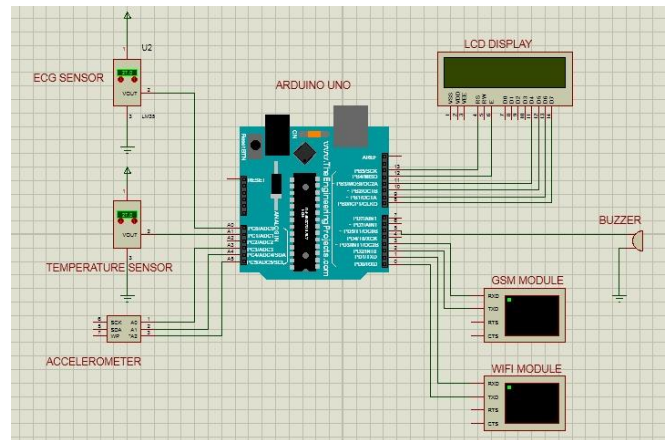


Fig 2. Circuit diagram of proposed system

WORKING PRINCIPLE

In order to satisfy the requirements of the system and solve all the problems caused by the system, we suggest a system that mainly consists of a transmitter and a receiver. A two axis accelerometer will be mounted on the finger of the patient from the patient's side to record any movement that may be stored in the transmitter. This accelerometer is capable of measuring the static acceleration due to gravity and thus finding the angle at which the unit is tilted with respect to the earth. Whenever the patient needs some kind of support he tilts the accelerometer in different directions. It is connected to the accelerometer which allows it to act as an input to the controller board, and the controller board then processes the information and sends it to where the actuators are. The performance of the accelerometer is dependent on the tilt angles, and the information is acquired by the controller. The controller samples the input voltages at varying intervals, maps the samples into integer values between 0 and 1023, and sends out these values in discrete 10-bit packets. The range of numbers here is wide and having a very small increase or decrease can make a big difference. In order to simplify the device, we mapped it a range of 0-5 Volts with a range of forward, backward, side-to-side and up and down which was finally able to be used by a patient who is blind and can not see the circuit board. Directions for exercise can be easily understood and used by any person using his/her thumb, wrists, or any part of the body capable of moving in directions. A predefined message catering to the basic needs of the patients and those needed for emergency will be stored in the ranges allocated to a specific path as described above. A typical example of the system: When a patient moves their finger right, the system show "food" or "water" immediately. In this part, you will send to the controller the value of tilting the accelerometer to the right. For the controller to then send it to the LCD, side of which will display the message. Upon receiving the message, the nurse will remotely take the

necessary action in order to help with the necessities of the message. In the event of an emergency, the patient should simply press an emergency warning that will signal a centre speaker to transmit a signal to the system receiver. The buzzer will be activated by the receiver when it is ready for it. A nurse will be able to monitor the patient's progress after this phase has been completed. Taking medicine at the right time is a serious business, but taking the Medic Alert bracelet that's on the system helps the doctor or nurse know the time of day that the medicine should be given. The Medicine Reminder is a tool intended for use by the nurse or caretaker so that an error is never made in giving the medications. The medication reminder features sends a message a day after medicine is dispensed. So we suggest a system in which the time table of all the patients will be stored in the database and the nurse will be reminded automatically when it's time to attend any patient according to the time table. The controller board will be programmed to provide this desired function. On interfacing the LCD with the controller, feeding the code into the software, and then running the real time clock the unit runs the time from the monitor.

V. EXPERIMENTAL RESULTS

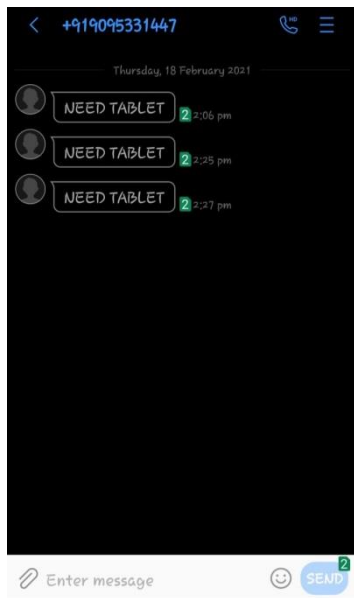
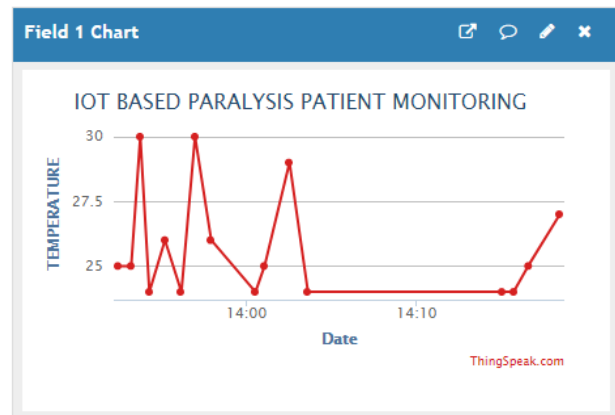


Fig 3. Tablet SMS



Fig 4. Food SMS



VI. CONCLUSIONS

This IoT based paralyzed patient monitoring equipment acts as a wearable device, which is a more effective system on the part of the paralyzed patient. The device is affordable as well as providing a way for patients to alert their caregiver of any needs by using their hand movements. E-cigarettes, in addition to vaporizing the nicotine provided by your cartridge, also control the state of vital framework inside of the body (their heart rate, blood pressure). If one of these parameters goes outside of the normal range the person wearing the device will automatically be alerted to provide assistance in case the critical condition that causes it occurs.

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