

Neuro Friend-An Application to Monitor and Supervise the Mentally Disabled Patient

Rohit Deshpande¹, Yadyesh Machcha², Prathamesh Dhanawade³, Shashank Gaikwad⁴, Sagar Mistry⁵, Rama Gaikwad⁶

^{1 2 3 4 5}*B.E, Department of Computer Engineering, Anantrao Pawar College of Engineering, Pune, Maharashtra, India*

⁶*Professor, Department of Computer Engineering, Anantrao Pawar College of Engineering, Pune, Maharashtra, India*

Abstract - Among the applications that Internet of Things (IoT) facilitated to the world, Healthcare applications are most important. In general, IoT has been widely used to interconnect the advanced medical resources and to offer smart and effective healthcare services to the people. The advanced sensors can be either worn or be embedded into the body of the patients, so as to continuously monitor their health. The information collected in such manner, can be analyzed, aggregated and mined to do the early prediction of diseases. The processing algorithms assist the physicians for the personalization of treatment, and it helps to make the health care economical, at the same time, with improved outcomes. Also, in this paper, we highlight the challenges in the implementation of IoT health monitoring system in real world.

Index Terms - Alzheimer, Healthcare, Internet of Things.

I. INTRODUCTION

Now a days, the society is facing a huge problem of monitoring the mentally disabled patients who are suffering from chronic diseases such as Alzheimer, Stroke etc. IoT based monitoring system for the intellectual disabled patients will keep watch on the patient. In this application “Neuro Friend” we can keep watch on each activity of the patient and notify to the family member if any kind of dangerous activity occurs. All the accident-prone movements would give an alert to the family members or the nearby people, so they can approach to the location as soon as possible. In this system we will put a camera at the patients surrounding e.g. in the patient’s room. We will also build a motion sensing unit at the location which will detect all type movements done by the patients. As soon as any dangerous movement tends to

occur the alarm will rise and the family members in the other room will be warned. In case we will also set up the GPS trackers in the clothes of the patients for tracking if the patient goes anywhere or lost. Keeping attention towards the patients become easy and time relieving, Prevention of accidents of the patients, Reduction of cost for patient’s hospitalization or orphan aging, becomes possible with the help of this application “Neuro Friend”. This project is accessible through both the platforms of android and website. The android application is named as “Neuro Friend” and consist of login page and all modules such as camera, sensor, alarm, GPS module respectively. The website is the opensource platform for the user who is unable to use android app. The user can directly login from the web and can keep watch on the patient. The website also contains the modules which are there in the application “Neuro Friend”. For the implementation of this project we are using Internet of things (IOT) as the main domain. In that we are using Raspberry-pi 4, motion sensor, GPS sensor, alarm for the construction of the system. For the database connectivity in the website Django python is used and in android the database connectivity is done with the help of java, mysql.

II. LITERATURE SURVEY

Nowadays, Heart-related diseases are on the rise. Cardiac arrest is quoted as the major contributor to the sudden and unexpected death rate in the modern stress filled lifestyle around the globe. A system that warns the person about the onset of the disease earlier automatically will be a boon to the society. This is achievable by deploying advances in wireless

technology to the existing patient monitoring system. [1] Smart Healthcare Monitoring using IoT by Shubham Banka, Isha Madan, S.S. Saranya ,this paper proposed a system can be set-up in the hospitals and massive amount of data can be obtained and stored in the online database. Even the results can be made to be accessed from mobile through an application. [2] A Wearable Smart Health Monitoring System by Souvik Tewary, Shreyosi Chakraborty,Joshita Majumdar this paper states an approach towards Designing A Wearable Smart Health Monitoring System Measuring The Vital Parameters and Emergency Situations in Real- Time and Providing the Necessary Medical Care Through Tele-Medicine. [3] Internet of things (IoT) based health monitoring system and challenges by M. Sathya,S. Madhan, K. Jayanthi, proposed a system that the challenges in sensing, analytics and prediction of the disease are also highlighted and those can be addressed to provide a seamless integration into the medical field. [4] IoT based health monitoring system by Prajoona Valsalan, Tariq Ahmed Baomar, Ali Hussain Baabood this paper proposed An IoT based health monitoring system was developed. The system monitored body temperature, pulse rate and room humidity and temperature using sensors, which are also displayed on LCD.

III. EXISTING SYSTEM

The mentally retired or the patients suffering from the disorders like alzheimer need a lot of attention and care taking. This type of patient requires 24/7 attendant caretaking for their daily chores. Paying attention to the whole time sometimes become hard and may lead to some mishappens like the patient leaves his place and went anywhere or some accidents may occur. In such case the family keeps 24/7 attendant for care taking of that patient. Or the patient is shifted to the orphanage. The patient may be lost in case of there is no relative nearby. The patient may also seek help while he is alone in the home. Due to lack of attention the patients may lead to accidents or some other harmful situations may occur. In case of a hospital, either the nurse or the doctor has to move physically from one person to another for health check, which may not be possible to monitor their conditions continuously. Thus, any critical situations cannot be found easily unless the nurse or doctor checks the person's health at that moment. This may

be a strain for the doctors who have to take care of a lot number of people in the hospital. Also, when medical emergencies happen to the patient, they are often unconscious and unable to press an emergency alert button.

IV. PROPOSED SYSTEM

The defined project is based on monitoring and controlling the activities of the mentally disabled patients. The patient suffering from the chronic diseases like Alzheimer and stroke can be monitored with the help of the proposed project "Neuro Friend".

Following are the modules present in our proposed system:

1. Live camera monitoring.
2. Motion sensing.
3. Immediate command assistance.
4. Tracking the current location of the patient.
5. Alert message to the user through email as of any dangerous situation tends to occur.

The core idea of our project is there will be a 24/7 camera as well as motion sensor working at the patient's location. The motion sensor will sense any type of movement done by the patient and immediately the speaker will assist the patient to do any activity which will protect the patient from accident. As soon as the movement occurs an alert message would be sent to the website of the user. Through the website the user can see the current live screening from the user's current location and can give appropriate commands directly to the patient. With the help of GPS monitoring module the user can track the exact location of the patient if patient leave the home by mistake. In this project we have created a website which is connected to the Raspberry pi.

In this website there are four modules:

1. Profile
2. Supervise
3. Doctor Summary
4. Tutorial Guide

In the profile module the whole information of the user given at the time of signup is displayed briefly. In the supervise module the actual supervising modules are added. They are as follows:

1. Live camera.

2. Give Commands.
3. Track your patient.

The ‘live camera’ module will directly screen the live stream of the patient’s current location and all visual scenario of the patient to the user. The ‘Give commands’ module will allow the user to give commands directly to the patient from the user’s current location as per user’s choice. The working will in the following manner, the user will type the command that he wants to give to the patient in the text box provided and hit the give command button. As soon as the give command is pressed by the user the speaker installed in the patient location will give the command to the patient. The ‘Tract your patient’ module will be used in the situation in which the patient leaves his/her house and goes in the society unknowingly. On this time the user can track the patient’s current location with the help of GPS module attached to the patient’s cloth. The live location of that GPS tracker is given to the website and user can easily see the current location of the patient on the maps provided in the webpage. The next main module is ‘Doctor’s summary’, in this module the user can enter all the patient’s details like important reports given by the doctor, prescription of the medicines and various X-Rays also. The user can enter all the above mentioned subjects in the jpg format. With the help of this module the user can view all the necessary information regarding patient’s medical history easily. The next module is ‘Tutorial Guide’, this module consists of the guidelines to use the project “Neuro Friend” in detail. It also described the steps to access all the parts and modules of the website in simple understandable language to the user. We have used the Django framework of python for the implementation as well as designing of the website. Django provides its own database and provides all the python libraries to work on the Raspberry pi. The User interface of the website is done with the help of simple Html and Ccs which makes the website more interactive. We have used Raspberry pi 4 to do all the sensing procedure and the code of all IoT devices is done in the python programming language. Hence this was the proposed system of our project and the detailed information of each and every module of our project.

V. ARCHITECTURE DIAGRAM

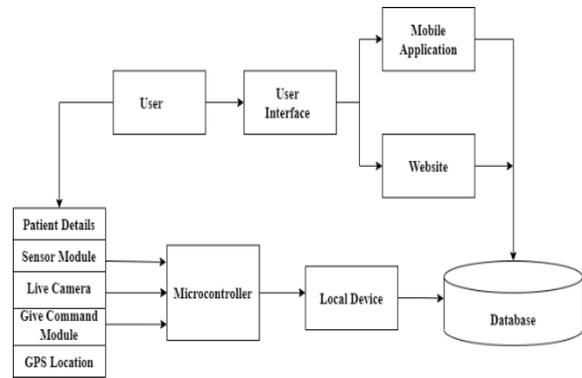


Figure 1: Architecture Diagram

Modules:

1. Login Activity - It Accepts Username and Password in text field and matched with database.
2. Home page - It consists four buttons, camera, Alarm , Sensor , GPS. These four modules are mainly accessed.
3. Alarm -The alarm will rise if the camera and the motion sensor will detect any harmful movement of the patient.
4. Monitor Patient - In this module user can view the location of patient through camera.
5. Access Location of Patient - In this module we can access the location of the patient.
6. Doctor Summary - In this module user can add doctor details, prescription, patient details as well as patient reports.
7. Database - It is used to store patient data and location.

Technologies:

1. Web Technology - Web Technology refers to the means by which computers communicate with each other using Markup languages and multimedia packages. It gives us a way to interact with hosted information like websites. Web Technology involves the use of hypertext markup language (HTML) and cascading style sheets (CSS).
2. Raspberry pi - The Raspberry Pi is a Credit sized computer that plugs into a computer monitor or tv and uses a Standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing and learn How to program in languages like Scratch and Python.
3. Django - Django is high-level PYTHON web Framework that enables rapid development of

secure and maintainable Websites Built by experience developers Django takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel.

VI. APPLICATIONS

1. Hospitals
2. Old Age Home.
3. Residential Homes.

VII. CONCLUSION

In this application Neuro Friend, we are developing patient's monitoring system using a website, this system will be proactive towards preventing accidents mishappens related to the patients.

ACKNOWLEDGMENT

It gives us great pleasure on presenting the project report on 'Neuro Friend- An Application to monitor and supervise the mentally disabled patients. The study and the analysis of the project wish to express our gratefulness to Prof. Rama Gaikwad for giving us all the help and guidance we needed. We are really grateful to her for her kind support. Their valuable suggestions were very helpful. We would like to express our deepest appreciation towards principal Dr. Sunil Thakare, ABMSP's Anantrao Pawar College of Engineering & Research, and we are grateful of Prof. Jitendra C. Musale, Head of Computer Engineering Department, ABMSP's Anantrao Pawar College of Engineering & Research, for his indispensable support, suggestions and for providing us infrastructure for our project. In the end, our special thanks to Lab Assistants Mrs. Sheila Nagpure for providing us various resources such as laboratory with all needed software platforms, continuous Internet connection, for Our Project.

REFERENCES

- [1] Laubhan, K., Trent, M., Root, B., Abdelgawad, A., Yelamarthi, K.: A wearable portable electronic travel aid for the blind. In: IEEE International Conference on Electrical, Electronics, and Optimization Techniques (2016).

- [2] Himadri Nath Saha, Supratim Auddy, Subrata Pal: Health Monitoring using Internet of Things (IoT), IEEE Journal pp.69–73, 2017.
- [3] Sarfraz Fayaz Khan, "Health Care Monitoring System in Internet of Things (IoT) by Using RFID", IEEE International Conference on Industrial Technology and Management pp 198-204, 2017.