

IOT BASED SMART-WHEELCHAIR

^{#1}Prathmesh Wagh, ^{#2}Sagar Salke, ^{#3}Amol Mhaske, ^{#4}Tejas Dhawle,
^{#5}Prof. Ajit Pagar

¹wprathmesh1996@gmail.com

^{#12345}Department of Computer Engineering,

Dr.D.Y. Patil School of Engineering, India



ABSTRACT

Ubiquitous devices are becoming a part of people's day-to-day life. Smart devices not only aid to people's life but also are becoming a crucial part of physically challenged and aged people. The need for safe and independent mobility for the elderly and physical challenged people is of prime concern. In our project we provide the primary need to the handicap people. The Key feature of system is to get Instant help to the disable person. Using the Accelerometer sensor we detect the fall of person. We also provide the help button to the wheelchair which is helpful to get instant help to the user or Buzzer is provided to notify nearest people. Android application is use for the all types of notification. Using the GPS the live location of wheelchair is track. The location is display on android application. The main purpose of system to get instant help to the handicap people and reduce the death ratio of this people.

Key Words:-Smart Wheelchair, Accelerometer, GPS, Smart Phone, Real time, Buzzer, Panic Button.

ARTICLE INFO

Article History

Received: 5th June 2019

Received in revised form :

5th June 2019

Accepted: 7th June 2019

Published online :

7th June 2019

I. INTRODUCTION

There are thousands of people in India, who are facing disability in movement. They face discrimination on regular basis which takes many forms. These people are considered more as a liability than an asset to the society. Since they encounter discrimination, they tend to alienate themselves from the society as they feel unwanted and rejected. According to census 2001, in India there were around 0.6% of population had disability in movements that is around 6 million people!.. The wheelchair is providing with accident and fall detection system and it also provide an instant help to the handicap people when it needs. Our system is real time system which contains the live tracking of Smart Wheelchair. Smart wheelchair has gained a lot of interests in the recent times. The machines can also be used in old age homes where the old age persons have difficulty in their movements. The devices serve as a boon for those who have lost their mobility.

Different types of smart wheelchair have been developed in the past but the new generations of wheelchairs are being developed and used which features the use of smart devices and hence leaves a little to tinker about to the user who uses the wheel chair. The project also aims to build a similar wheel chair which would have a sort of intelligence and hence helps the user on his/her movement.

II. LITERATURE SURVEY

Sr. no	Paper	Description	Pros	Cons
1.	Mohammed Faeik Ruzaij Al-Okby1, 2, Sebastian Neubert3, Norbert Stoll3, Kerstin Thurow1Center for Life Science Automation (celisca), University of Rostock, Rostock 18119, Germany	Develop wheelchair for the handicap and paralysis patients, control by the voice and head tilts.	1.The system design is based on using two different voice recognition modules. 2. A powerful microcontroller for data processing and decision making.	1. Voice commands used for control the moments of wheelchair.

2.	Artee Kunal Dalsaniya, Dhanashri H. Gawali NBN Sinhgad school of Engineering Pune, India	The three main functions of the proposed system are, 1) wheelchair navigation using multiple input, 2) obstacle detection using IR sensors, 3) home automation for disable person.	1. Wheelchair navigates using voice, head tilt, hand moments in fixed position. 2. Accelerometer sensor used for the capture the positions of head and hand. 3. IR sensor used for the obstacle detection.	1. Control by the voice, hand motions and head tilt. 2. Detect the obstacle. 3. Home automation.
3.	Sumit Desai, Dr. S. S. Mantha, Dr. V.M. Phalle Department of Mechanical Engineering, Veer mata Jijai	Develop the electronic power wheelchair (EPW) control by the motor rather than manually.	1. Wheelchair Control by the motor.	1. Used for the move wheelchair using motor.
4.	Celia SHAHNAZ*, Ahmed MAKSUD, Shaikh Anowarul FATTAH and Sayeed Shafayet CHOWDHURY Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology Dhaka, Bangladesh.	A feature of the proposed scheme is 'Destination Mapping' by which the wheelchair learns the destinations accessed by the user and autonomously reaches those destinations using speech recognition. There are also other features such as rough surface detection, torque adjustments, slope and obstacle detection which promise a comfortable and safe ride.	1. Smart Wheelchair for move from one place to another. 2. Windshield wiper motor used for the motion.	1. Usefull for the reach destination without any help. 2. Slope and obstacle detection for safe and comfort ride.
5.	Doshi Siddharth P. VLSI and Embedded systems design, GTU PG SCHOOL, Gandhinagar, Shripad Deshpande Syncspace solutions Pvt. Ltd., Pune,	Develop smart wheelchair control by the touch screen navigation panel. A semi-automatic vision function, heart rate sensors and physiological stress sensors have been integrated.	1. GPRS used for the location deterministic. 2. The Wheel-Chair is controlled by RTOS as its core operating system. 3. Heart rate sensor.	1. Smart wheelchair which is control by the navigation panel and avoid the obstacles using this panel. 2. Taking health care of person.
6.	Fitri Utamingrum, Tri Astoto Kurniawan, M. Ali Fauzi, Randy Cahya Wihandika, Putra Pandu Adikara Computer Vision Research Group, Faculty of Computer Science, Brawijaya University Malang, Indonesia	Proposed approach incorporates human tracking algorithm that later will be used to make the wheelchair moving independently without assistant to push from behind.	1. Human tracking system used for move wheelchair independently. 2. Using this approach the tracked human must carry a certain RFID tag. Another approach also use GPS.	1. Human tracking system used for the moving the wheelchair without any help.
7.	Fitri Utamingrum, Tri Astoto Kurniawan, M Ali Fauzi, Rizal Maulana, Dahnil Syauqy, Randy Cahya Wihandika, Yuita Arum Sari, Putra Pandu Adikara .	The line laser image to recognize the pattern of the detected obstacles.	1. Laser used for the obstacle detection. 2. Camera used for the image processing.	1. Obstacle avoidance system for the wheelchair.

III. SYSTEM REQUIREMENTS :

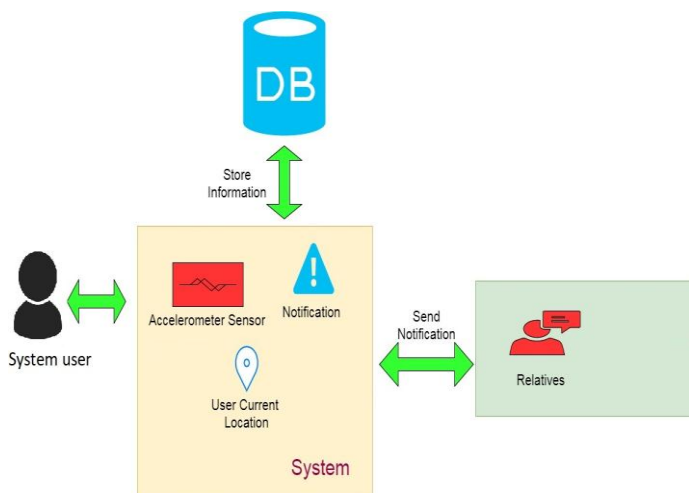
Hardware :

- GPS
- GSM
- Help Button
- Controller
- Buzzer
- Accelerometer Sensor

Software :

- Operating System : Windows/XP
- Front End: Android
- Programming Language : JAVA
- Scripts : PHP
- Tool : Android Studio, Mysql Server
- Database: Mysql
- Controller : Arduino

IV. SYSTEM ARCHITECTURE :



V. MODULE

1.Registration : User can register to the smart wheelchair application .All wheelchairs has their unique wheelchair id, using that id specific relative get information about their patient.

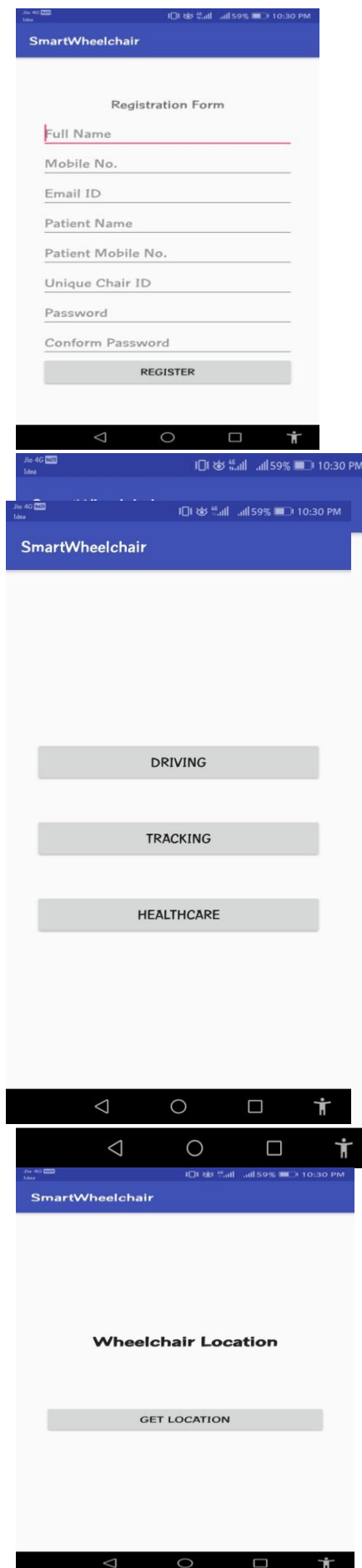
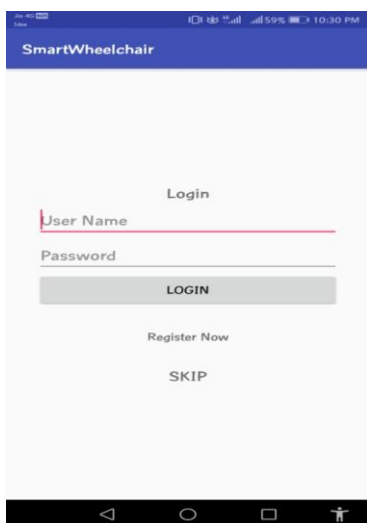
2.Driving : This module help to full paralyzed person. Relatives of that person will move the chair of that patient using the drive option which is given in application.

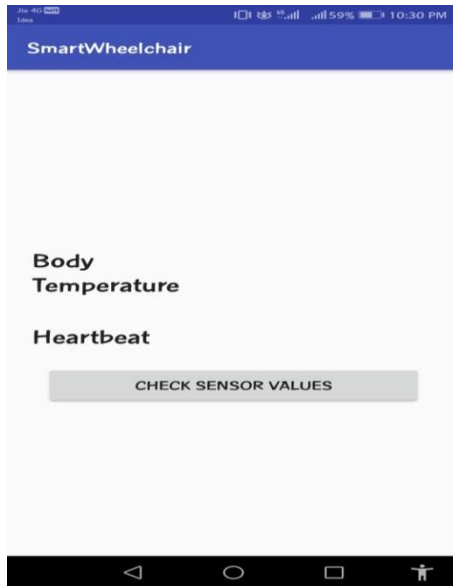
3.Healthcare : Relatives of the patient can also monitor the health of the handicap person. Heartbeat and temperature sensor use for the detection of persons heartbeat and body temperature.

4,GPS : We use the GPS for the detect the current location of the wheelchair.

5.Ardino : Ardino use to communicate between the application and the smart wheelchair.

VI. SCREENSHOTS OF APPLICATION





VII. CONCLUSION

New engineering developments offer opportunities to develop smart wheelchair assistive technology that can improve the lives of many people who use wheelchairs. In our work, we are designing tomorrow's intelligent wheelchairs: we are developing an intelligent wheelchair that is aware of its surroundings so that it can assist its user in a variety of tasks.

The goal of this smart wheelchair project is to enhance an ordinary powered wheelchair using sensors to perceive the wheelchair's surroundings.

VIII. FUTURE SCOPE

- **Alternate power source:**

Solar panel roof can be used as alternative power source and also it can be a protective layer from rain and sun.

- **Physically Challenged People:**

Physically Disabled People can use it as per their purposes. People who are able to use their hand can use Joystick; People suffering from certain paralysis can use either voice or head movement as per requirement.

- **Patients in the Hospitals:**

People suffering from certain paralysis can use either voice or head movement as per requirement.

- **Old Age Homes:**

People at old age homes can use this chair as per their requirement.

IX. ACKNOWLEDGEMENT

The authors would like to thank Prof. Ajit Pagar for his help in proofreading the paper and re-organizing the references and search keywords.

REFERENCES

1. Development and Testing of Intelligent Low-Cost Wheelchair Controller for Quadriplegics and Paralysis Patients [2018].
2. Smart Phone Based Wheelchair Navigation and Home Automation for Disabled [2017].
3. Advances in Smart Wheelchair Technology [2017].
4. Low-cost Smart Electric Wheelchair with Destination Mapping and Intelligent Control Features [2016].
5. Embedded system design for real-time interaction with Smart Wheelchair [2016].
6. Adaptive Human Tracking for Smart Wheelchair [2016].
7. A Laser-Vision based Obstacle Detection and Distance Estimation for Smart Wheelchair Navigation [2016].