

# WHEELCHAIR MANAGEMENT SYSTEM USING IOT

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**Abstract:** The expanding improvement of the biomedical framework and keen innovation significantly affects keen gadgets. an Automatic wheelchair is one of them to be improved with the favors of this cutting edge innovation. In this paper, an Automatic wheelchair geography is proposed which is worked by a Joystick and it is Connected to the Cloud. It accompanies a ton of cutting edge highlights for individuals with disabilities who can't walk or go without the assistance of others. It is an Automatic Wheelchair which utilizes Temperature sensor, Heartbeat sensor, Obstacle identification sensor with GPS and WI-FI Module to make it programmed. we are thinking of a plan of wheelchair which will be a resource for clinical division and to make it more development in existing innovation, we have outfitted our model with wellbeing observing framework including constant estimations of internal heat level, Heartrate. Which will in the end diminish odds of miss-occurring and permits the casualty to carry on with a more liberated life.

**Keywords:**-- *Wheelchair, Health Monitoring System, IOT, Temperature, Ultrasonic and Heartbeat Sensors, Arduino IC.*

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## I INTRODUCTION

We know that the needs of many people with disabilities can be overcome with power wheelchair. Though we have evolved in the field of health care and technology, but we are still not good enough to solve difficulties of this sector of population. This project is related to an Health Monitoring wheel chair with an use of manual joystick. The main objective of this project is to felicitate and increase the movement of people who are handicapped and the ones who are not able to move freely. Therefore, we are coming up with a design of wheelchair which will be an asset for medical department Science and technology have been evolving regularly. Smart technology is enriching the standard of living of human beings. In this modern age, the world is becoming smart with the rapid development of science and technology. Smart houses, smart cars, smart apps, smart technologies make life simpler and quicker than it has been in decades. Yet there are growing classes of people who are unable to benefit from new technology advances because of their disability. Particularly disabled people with limited mobility are still living a miserable life. A Automatic wheelchair is a new tool designed to enhance the life of a disabled person. In a very simple language, a wheelchair is a machine with wheels enabling movement, which gives power to a physically disabled person to move around without depending on others. People have disabilities with their feet, lower extremities which puts a limit to perform regular task in their day to day life. Still these wheelchairs have not satisfied the needs of the disabled people. It is therefore crucial that problems are understood in detailed and accordingly sensors should be placed, hence this paper is a result of the needs and includes development of a multifunctional chair. The wheelchair is one of the foremost commonly used assistive gadgets for enhancing personal mobility, which may be a precondition for enjoying human rights and living in dignity.

Wheelchairs assist people with disabilities to become beneficial individuals in their communities.

Almost 10% of the worldwide population about 650 million people have disabilities. Studies indicate that of these some 10% require a wheelchair. Wheel-chairs are driven manually with the assistance of another individual or by implies of self – propelling. To diminish the complexities for those who don't have the quality to move their chairs by themselves the wheelchairs are electrically powered. The wheelchair is navigated using multiple-input and obstacle is detected by using Ultrasonic sensors for the disabled person. The Wheelchair can be moved by using the joystick. Moving hand in four fixed positions so the wheelchair moves. ATmega328 is used as a processor and motor driver L298N is used as a motor driver in a smart wheelchair where DC Gear Motor, Ultrasonic Sensor, Temperature sensor, Heartbeat sensor, GPS Module and WiFiModule are also used we used Thingspeak cloud for monitoring and Storing the data which read by sensors. Arduino UNO is used to control the wheelchair-using relay as a motor driver, an ultrasonic sensor is also used in an automatic wheelchair. A wheelchair control by hand motion is improved that enabled by a microcontroller system. A wheelchair is controlled by using joystick movement for the physically disabled persons. joystick are used for the control of the wheelchair. System stored data to cloud

## II LITERATURE SURVEY

### Wheel Chair with Health Monitoring System Using IoT

Shubham Sagar Nayak<sup>1</sup>, Prateek Gupta<sup>2</sup>, Upasana<sup>3</sup>, Prof. Atul B. Wani

This paper speaks about our methods of preventing accidents, methods by which we can control the movement of chair and working of Health Monitoring System. Till now from our detailed survey and deep knowledge of problems our only

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motive is to prevent them from existing. If any way sum threat is detected, the functionality should be smart enough to stop the motion further and respond accordingly.

**Design of An Intelligent Wheelchair for Handicap People**

Mubdi-UI Alam Sajid, Md Firoz Mahmud, Mim Naz Rahman

This paper shows the word report in The 2011 census report states that there is an increase in country's disabled population by 22.4% between 2001 and 2011. In 2001 count of disabled was 2.19 crore in 2001, which has gone up to 2.68 crore in 2011 out of which 1.5 crore are males and 1.18 crore are females. Most of the disabled are those with physical disability, accounting for 20.3% for total disabled population.

**IoT Based Smart Wheelchair for HealthCare**

Divya Jennifer DSouza, Sanket Srivatsava, Ruth Prithika, Sahana

Most of the papers reviewed presents discussion on control of smart wheelchair in terms of driving and steering. Control of wheelchair using different techniques such as Brain waves, Tongue Driven Systems, Face Movement Control, Hand Gesture Control etc. is discussed. Very few papers discussed the possibilities of Health Monitoring System using various sensors that can be integrated into the wheel chair. a survey of the different type of smart wheel chairs is available. They also discuss on the HMI- Joystick Steering

**III. EXISTING SYSTEM**

The wheelchair operates on a android phone and it required particular application in the phone to the movement of the wheelchair. Mostly the various wheelchair are remote controlled so they need a android phone and application.

Disadvantages of Existing System:-

- It require android phone and application
- Does not monitor data
- Causes injury to the operators.
- Remote controlled.

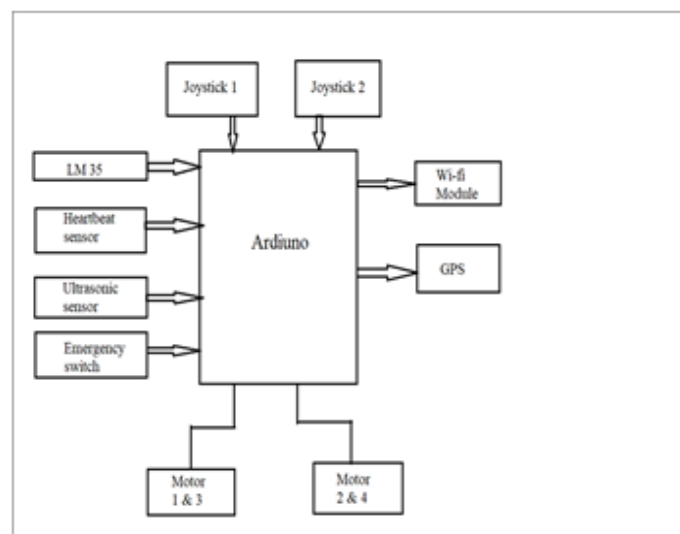
**IV. PROPOSED SYSTEM**

In our proposed system, It is a combination of Smart wheelchair which operate on joystick and it also have the Health monitoring sensors .the data of the sensors are stored on the and it is incorporated with ultrasonic sensor for object detection and avoidance mechanism, joystick gives commands to the motor and Motor is used for movement purpose to move front and back. We are using the wifi module to communicate with cloud and GPS for location tracking. and we use the emergency switch to stop the wheelchair and a accelerometer to check the wheelchair is tilted or not.

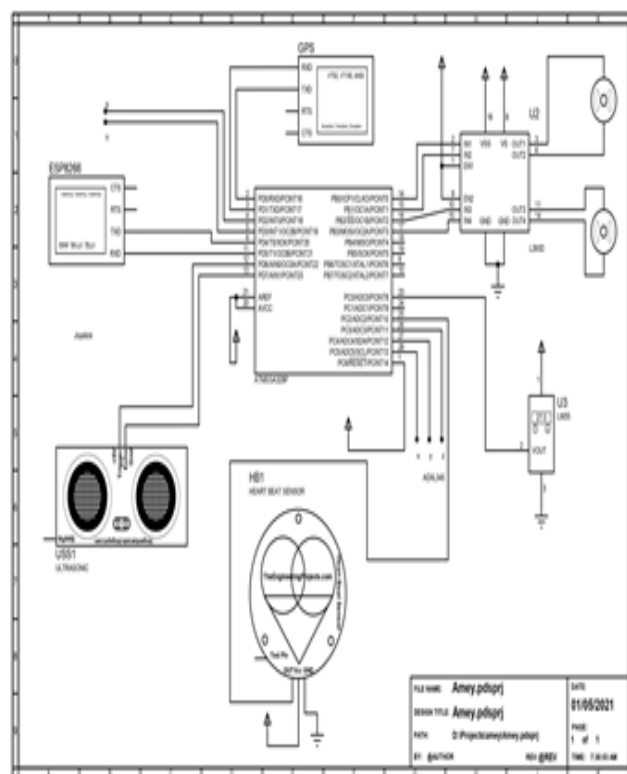
A. Advantages of Proposed System:-

- Health Monitoring is possible.
- It controlled by hand using joystick module.
- It requires very less human intervention.
- It causes no injury to the operator.
- It produces less noise.
- Zero chances of breaking the wheelchair.

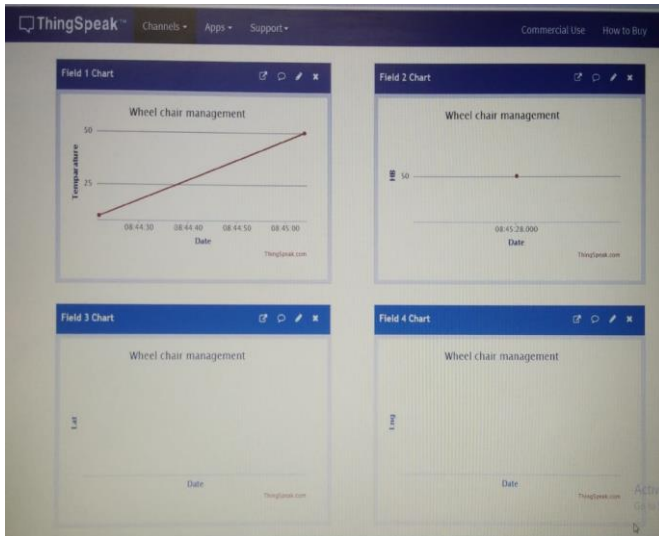
**V. ARCHITECTURE**



**VI. ELECTRONIC CIRCUIT**



## VII. SOFTWARE DESIGN



### A. Thingspeak cloud

According to its developers, "ThingSpeak is an open-source Internet of Things (IoT) application and API to store and retrieve data from things using the HTTP and MQTT protocol over the Internet or via a Local Area Network. ThingSpeak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates". ThingSpeak was originally launched by ioBridge in 2010 as a service in support of IoT applications.

ThingSpeak has integrated support from the numerical computing software MATLAB from MathWorks allowing ThingSpeak users to analyze and visualize uploaded data using Matlab without requiring the purchase of a Matlab license from Mathworks.

ThingSpeak has a close relationship with Mathworks, Inc. In fact, all of the ThingSpeak documentation is incorporated into the Mathworks' Matlab documentation site and even enabling registered Mathworks user accounts as valid login credentials on the ThingSpeak website.

## VIII. TEST RESULTS

**The following results have made from this project:**

- The motors are used for movement of wheelchair.
- Ultrasonic sensor detects the obstacles and if the obstacle is detected then stops the wheelchair with the help of controller
- Health monitoring system has three sensors to detect heartbeat rate, temperature of the person on the wheelchair.
- The sensor output then uploaded to thingspeak cloud.
- Thingspeak cloud stores the data in graphical format which can be accessed from anywhere so that the health of the patient/person can be observed by doctor properly.

## IX. CONCLUSION

The desired completion of this project will enable a great ease in movement and socializing of disabled people with negligible human efforts. Also, it is easy to use and operate as the movement are just one touch away. The module is compact and economical; the various sensors present in the prototype along with the health monitoring system makes it a much enhanced module, which is very reliable and helpful.

## X. FUTURE SCOPE

Further implementation of voice controlling system for the movement of wheelchair can be installed in the existing prototype. These will increase the mobility level of chair to a very high standard, which will be highly efficient and less dependent on other sources to move. Also, the implementation of gear box will increase the speed of chair and handling as well. We can also install solar power panel for promoting the eco-friendly charging of this chair. Hence, all these changes on a whole will prove to be a boon in medical field.

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