

WHEEL CHAIR MONITORING SYSTEM USING IOT

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Abstract— We all always wants to be very independent mainly the ones who have to pass out their entire lives in wheelchairs. Generally a person in the wheelchair has to totally and completely depend upon somebody to always be taken care of, but this is a project that he/she does not need to depend on any other person and can become more independent. The proposed system which is easy and most efficient ways to solve the problem of the person in the wheel chair, and it is almost fully automatic. This wheelchair provides OLED-screen along with touch sensors for mobility, heart beat detection, Anti-fall detection, temperature variation, medicine remainder, Eye-Saket fixation using image processing which does not depend on the ability to participate in society. By the recent studies on various wheel chairs we have come up with a project that verifies the current available technologies to help the person in wheel chairs to become more independent.

Keywords— *User Safety, OLED-Screen, Touch control, Health Monitoring, Eye- Saket fixation .*

I. INTRODUCTION

IOT can be represent by a operation of tools, detectors, end user support network technician, and plan for the intercalate information. IOT contribute the time to the computer positioned request and here existing actual fact for greater and flat co-operation. It revolve within an demonstration of the edge group of automated real structure while expand with detectors and button, current bright principles. It is forecast that the IOT must consist of lots of remains in a few years, while the IOT carries regarding enlarge implementation, accurateness, economic benefits. Dependent on the appliance characteristics, IOT implementation arrive easy to capture a board of information from a small number of unit to many megabytes. In a extremely easy language, a wheelchair is a device with swivel allow secure activity, which entitle a psychologically challenged people to travel with smaller dependent on some ones. Person have dysfunction with their palm, tootsie, bottom end which place a restrict to execute work in their standard of living. Yet this wheelchairs have undefined the essential of the differently able mankind and as well posture of the cultivated and cripple depend completely next to them analogous relation for their careful prerequisite, ardent heaviness of their household benevolent picture as it may be enormous. As the seniority of the short to intermediate quantity impairment specimen, physical or robotic wheelchairs are accomplishing where independent can make utilize of the wheelchair easily. In such situation ,wheelchair users in one place and another require autonomous adaptability and based on a further individual to the function of wheelchairs, hence critical that difficulty issues are recognize in particular situation and for that reason detectors have to supplied, accordingly this project is a outcome of the requirement and involves in establishment of a several operation on chair. There are large number of people in India, who are face the impairment in gesticulations or activity. They appearance disability on frequent base which lay hold of different mode. These people are examining further as a responsibility than an strong point to the community. Afterward they come across inequity, they take care of set passed on itself from the community as they go through undesired and refuse thousands of people. The wheelchair is given with disaster and tumble recognition technique and as well given an immediate assist to the impairment people at the time they required. Our organization is instantaneous organization thataccommodate the inhabit pursue of smart wheelchair. This wheel chair consists set of obtain object which Concentrate in the current times. The device could be utilized for senior citizen's home in which the elderly person face trouble in their fluctuations. The machine distributes for help the certain people stray their movability. Distinct form of smart wheelchair was originate in the previously. But the recent procreation of wheelchairs are exist enlarge and utilize the aspect for the use of smart machine and so that it determine who are all utilize the wheelchair. The main intention of this project is to design to make a related wheelchair that authorize accept a catalogue of brilliance and accordingly assist the user for their activity.

II. LITERATURE SURVEY

A mixed control wheelchair (MCW) was directed towards solving issues connected to the movement of seniors and Hemiparesis people. This system can be managed by voice command, finger movement, joystick and over mobile application, By switching this combination the wheelchair can be easily run. Tensor Flow that was included is associated with image representation, the images are further break-down and processed thus assist in detecting barriers clearly. New proposal on Raspberry Pi via system is better in cost-efficient as well as simple in architecture than earlier created system. During the interval of testing some accident occurred and that can be controlled in future by adding extra sensors and the proposed wheelchair is suitable for indoor use only [1]. This paper state with reference to the technique concerned with nipping accidents in the bud, Thereupon we can supervise the motion of the wheelchair carefully and operate along with Health Monitoring approach. This wheelchair utilize joystick and it is Wheelchair or impaired person. The system produces less noise accomplish zero chances of breaking the wheelchair, it make use of android phone together with specific application which behaves as remote-controlled, Data monitoring can be implemented further [2]. The viewpoint of producing Wireless Smart wheelchair lead an independent impact on smooth

controlling towards the system with the head/hand movement that will assist the move in accord with gesture of the person. There exist a wireless communication linking the human being and the wheelchair, the complete performance depends on paring Bluetooth module, in addition the Arduino blue control app for instance react as midway function. Self-control or mobile control can be used to handle the wheelchair, recommended to use more heavy-duty with lightweight motor to support several pressure of the system and the patient. The detection of obstacle was behind the scope of this wheelchair [3]. Most of the smart wheelchair are bothered in phrase of navigating and managing them by using various methodology. Preferably few ideas where based on Health tracking approach by utilizing various sensors that are specifically combined into wheel chair structure, this is accomplished by using IOT and processed by embedded system, further it is carried to the cloud. Next it takes an action in terms of any abnormality found in the patient, the message is sent over the GSM network that enables the patients to be in contact with the caretaker via SMS updates. More usage of embedded system causes bulk weight on the structure compare to other models the contribution of weights is more, this can be balanced in upcoming models [4]. This paper has put forward an intelligent wheelchair that possess dual control for the navigation purpose. The touch control and The android application control through which the user can handle the wheelchair. For the motion of the structure in different direction the patient/user has to press the screen appropriately. Android application besides can drive the wheel chair using particular application and Bluetooth technology act as an interfacing method, usage of smart mobile phone is required for the caretaker, the android Software can be updated to mange various operation as there is a accelerometer with the main system.[5]

III. PROPOSED SYSTEM

In our proposed system, It is a combination of Smart wheelchair which operate on touch sensors and it also have the Health monitoring sensors. Touch sensors 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.

IV. METHODOLOGY

It helps in terms of health monitoring and also in the case of deformity in heart rate and also in respiratory rate. The health monitoring will be done by taking heart rate and respiratory rate. Normal heart rate for adult is 60 to 100 bpm and normal respiratory rate is 12-20 bpm. If the range of heart rate and respiratory rate exceeds that could be an indication of pathology. And the heart rate signal is processed in the microcontroller. The heart rate for normal conditions is within fixed range for that age group. Here to detect any abnormality in a heart rate of person the signals are used deformity in heart rate such as Tachycardia. Hermiston is a breath sensors which is use to check the respiratory rate and the outcomes as their sensor is given to the microcontroller unit for the processing and it is processed to check variation in the normal flow. If any abnormality is detected an alert message is sent to the particular case taker via the GSM module. So that the care taker will come to know the condition of a patient and they can give a treatment to the patient accordingly.

Hardware Requirements

Processor : Intel i3 above.
 Hard Disk : 4.40GB
 Ram : 4 GB or above
 Any desktop / Laptop system with above configuration or higher level

Software Requirements

Operating system : Windows 7 and above
 Coding Language : Python
 Front End : Embeded Programming
 IDE : Pychram
 Database : Cloud

V. SYSTEM DESIGN

In the architecture diagram, the proposed system is explained. Here the data from the temperature sensor , pulse sensor, pressure sensor are obtained and serve to node MCU. Node MCU makes the decision and performs the event triggering through GSM protocol. To work with entire Arduino Board we need the Power Supply, so this power supply is provided using Rectifier and Regulator to the Arduino Board. The data which is required to send as a message to the care taker, this mode uses power supply and the amount of power supply is rectified and regulated, in which the data is to be transferred. The complete details of the patient which is present in the node MCU, it will be sent to the cloud in turn to the data storage to storage the patient details in it.

A. System Architecture

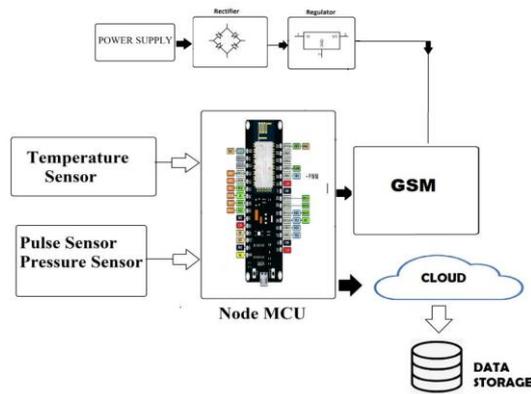


Figure 1: Block Diagram

B. Data flow Diagram

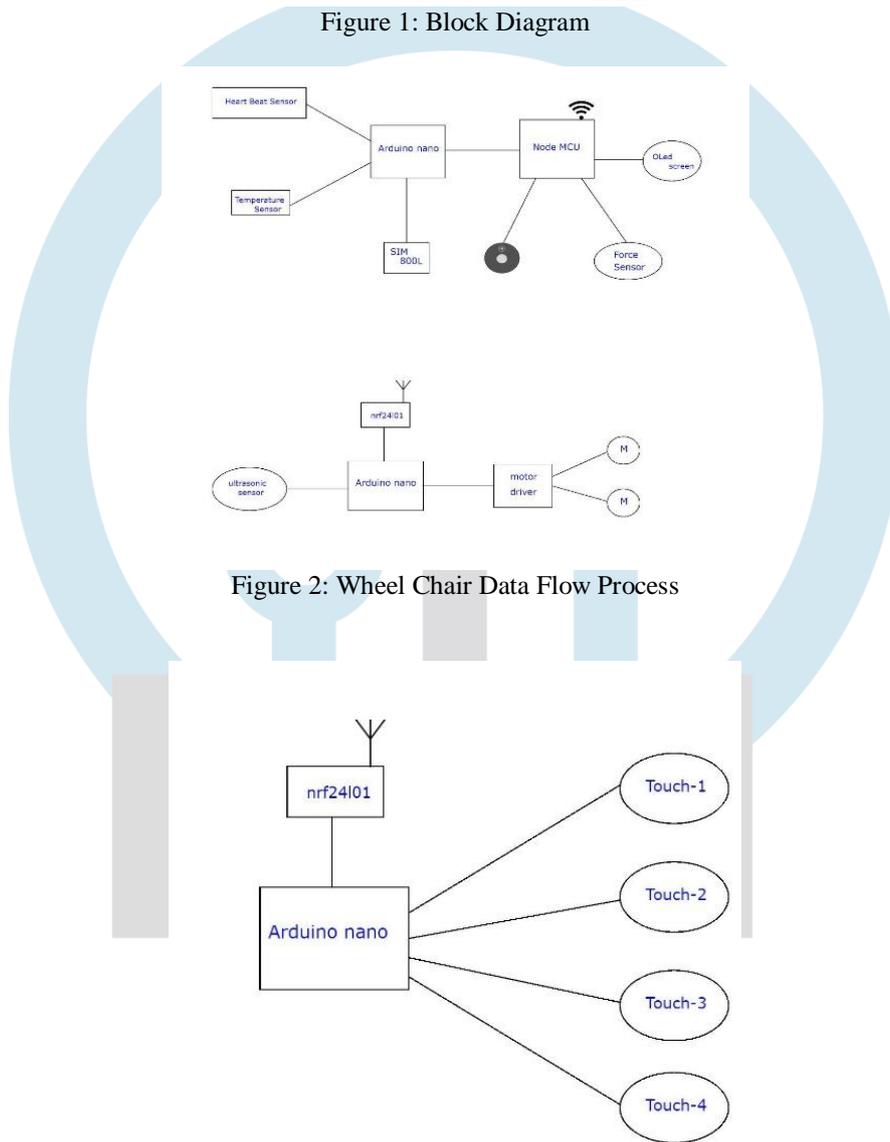
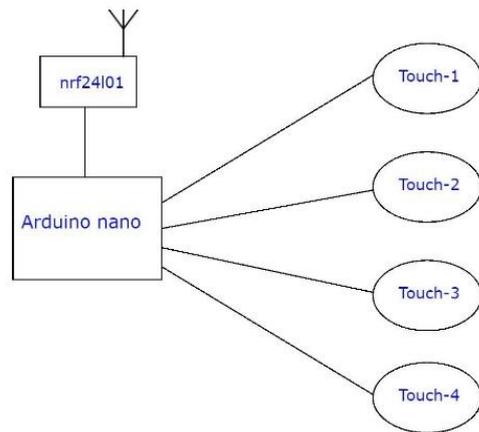


Figure 2: Wheel Chair Data Flow Process

Figure 3: Touch control Remote data Flow



VI. RESULTS

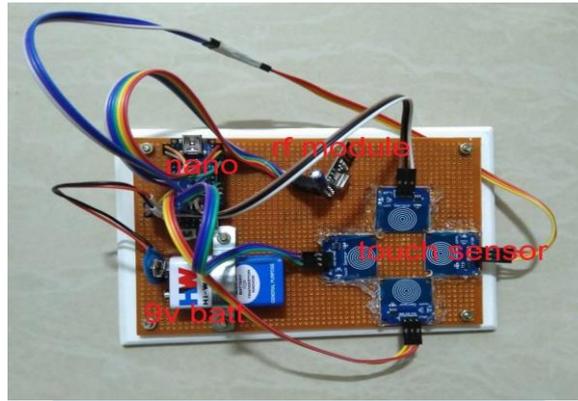


Figure 4: Touch Remote

This remote is used to control and navigate the wheel chair in all the four directions

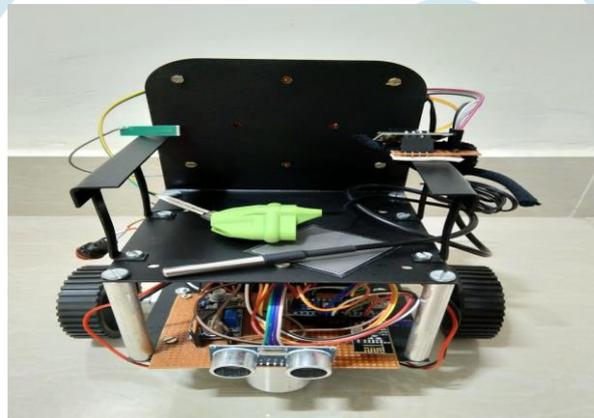


Figure 5: Wheel chair Front View

The health monitoring sensors, buzzer and ultrasonic sensors are placed along with OLED display screen

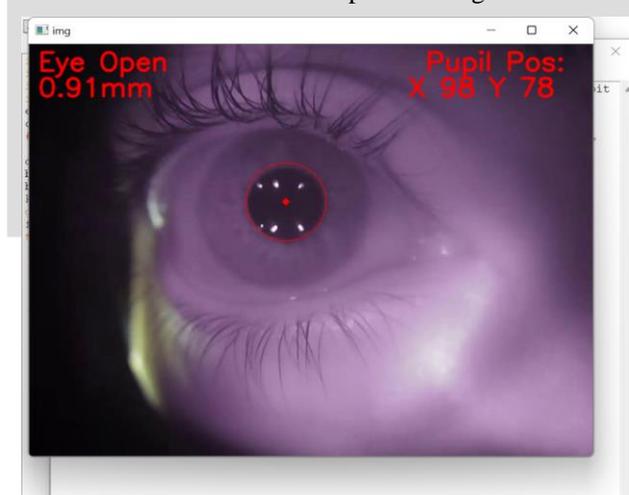


Figure 6: Pupil track

Using this pupil detection we can track the direction of the eye moment and recognition of image in front of person

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C:\Windows\System32\cmd.exe - python Track_eyes.py --shape-predictor shape_predictor_68_face_landmarks.dat
Right Eye Center Coordinates: 376 107
Left Eye Center Coordinates: 396 127
339
Right Eye Center Coordinates: 375 103
Left Eye Center Coordinates: 395 123
340
Right Eye Center Coordinates: 373 106
Left Eye Center Coordinates: 393 126
341
Right Eye Center Coordinates: 372 109
Left Eye Center Coordinates: 392 129
342
Right Eye Center Coordinates: 372 110
Left Eye Center Coordinates: 392 130
343
Right Eye Center Coordinates: 373 107
Left Eye Center Coordinates: 393 127
344
Right Eye Center Coordinates: 374 110
Left Eye Center Coordinates: 394 130
345

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Figure 7: Eye tracking with pupil angle

It provides the dataset based on the eye moment and it gives the reading of eye position in all possibilities

VII. 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 is 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 very enhanced module, which is very reliable and helpful. By monitoring the patient it also provides a unique mechanism for the pupil based requirement for patients and notifications to patient. And also by using current technology that is IOT, image processing for Eye-Saket fixation and various sensors for the heart beat detections, temperature variations, touch screen sensors, anti-fall detection, medicine remainders, and all the data which is obtained from all the sensors is directly connected to cloud and then there is a SMS facility which would be sent to the care taker in case the patient is in danger. We have come up with the project that would surely help the person in the wheel chair not fully dependent on the care taker and can be mostly independent. The person in the wheel would efficiently and effectively use the user-friendly wheel chair.

VIII. FUTURE ENHANCEMENT

Further implementation of voice controlling system or IR sensor glasses for the movement of wheelchair can be installed in the existing prototype. These two 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. A detachable metallic stair-case can be attached to climb slopes and small hurdles. Hence, all these changes on a whole will prove to be a boon in medical field.

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