"Manzil" The Smart Wheelchair

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Abstract - Over the number of years we have seen numerous mishaps or deaths of senior citizens or disabled people and one of the most pressing issues for this was not being given the required medical or mental help reports to show the number of deaths of senior citizens and disabled people happen not because of their diseases but because of the people not wanting to talk to them or they not able to freely move around while still getting the proper care. And the current wheelchairs which are offered in the market are just designed to do so. And the wheelchairs which are equipped with the latest technologies are coming at prices which one cannot afford to spend. So we have worked on combing medical help as well as emotional help. And to do so I have built a wheelchair that is targeted to help senior citizens in walking by making it joystick-controlled and it can also be controlled via phone, also built a two-way communication panel in which the people who cannot speak can display what they can say via a led screen and we have built a pulse rate sensor which detects your heartbeat and if your heart beats increase it will directly send the SMS to your family doctor and we have built an object detection framed which detects objects in front of your wheelchair via an ultrasonic sensor and at last we have built an Entertainment framework from which the person can educate themselves about various topics and can listen to the news.

Keywords – Wheelchair, Medical Attention, Senior Citizens, Disabled People,

INTRODUCTION

The Objective of our Wheelchair is to help people who are finding difficulty moving and disabled people also can use it – first, we are placing a joystick on the armrest which connects with the motor and we have placed this framework to help the person from getting one place to another and we have also made our wheelchair Bluetooth controlled which means you can control via phone and if the battery dies you can still operate it using a joystick and we have put a gyroscope which helps the person to move with just a move of the gyroscopes which can be put anywhere on the body on the second framework we have put – An LCD screen which will help the people who cannot speak help communicate with other people and there are various the number of sentences which we have put for eg – BUTTON 1 - {I Want To Go To The Washroom} And on our third framework we have an ultrasonic sensor to detect any object and if the object gets too close the wheelchair will automatically shut down the motor. And our last and our last and the most important circuit we have put a pulse rate sensor which detects your pulse and displays it on the LCD–screen and we have also put a gsm module which time to time sends SMS to your family doctor or your relatives. The robot mainly consists of the following frameworks

1}**Walking Aid Framework**

2}**Speaking Aid Framework**

3}**object Detection Framework**

4}**Health care Framework**

5} **Entertainment Framework**

1.1 Walking Aid Framework – W.A.F

Our Wheelchair consists of a ***Walking Aid Framework*** it consists of three ways by which the person can move and all of them are made to benefit a group of people there is many ways by which a person can travel with our wheelchair so it follows-

1} **Joystick** *System*

2} *Bluetooth System*

3}*Gesture System*

1.2 Speaking Aid Framework – S.A.F

This framework is designed to help people who are facing difficulties in conveying their messages. Eg – Mute people, Autism, Dementia, etc. so by just pushing a button the LCD screen will display instructions like "I Am Hungry"

1.3 Object Detection Framework – O.D.F

This framework is designed to immediately stop the wheelchair the cause if any object comes very close to the wheelchair For Eg – If the wheelchair comes very close to stairs, then the wheelchair will automatically stop

1.4 Health Care Framework – E.C.F

This is one of the main components of our wheelchair this framework consists of a temperature sensor, pulse rate sensor, and Bp sensor and the output of all these will be sent to the person's doctor or nurse

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1.5 Entertainment Framework

We have built this framework to keep the wheelchair user informed about the news and for basic entertainment features like – music, news, etc.

2. WORKING ON THE FRAMEWORKS

The working of all the frameworks has been explained below.

2.1 Walking Aid Framework "W.A.F"

This is one of the major components of our wheelchair and it is built upon several problems statements The first system which comes under this Framework is – *Joystick System* only works when a joystick is moved and when it is moved a message is relayed to Arduino which starts a chain event which results in the motor moving and the operator can control where he wants to move by just sliding the joystick. Then for the people who are paralyzed neck down or are just able to partially move the body parts we have derived a *Gesture-controlled system* for them. And if the person is just unable to move at all and needs assistance, we have made an app from which the family members of the patient or the nurse can move around the patient called *Bluetooth controlled framework*
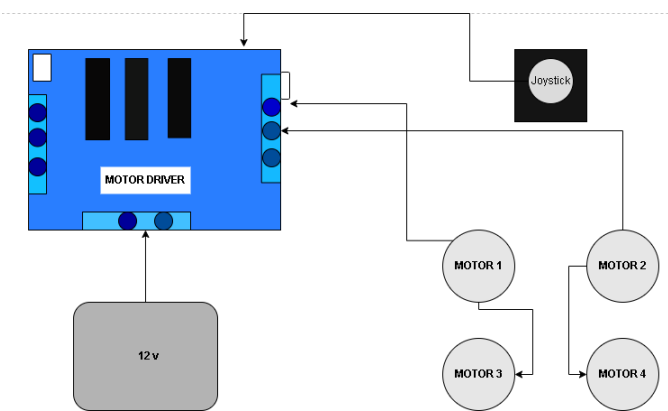

Fig -1: Block-Diagram for *Joystick system*

In a nutshell, The Walking Aid Framework will help in controlling the movement of the robot.

2.2 Speaking Aid Framework

For this framework, we have worked on the problem statement which the people who are unable to communicate or the people who are mute can use to communicate and the working of this is that we have connected an Arduino to an LCD Screen and we have derived statements to singular buttons statements such as "I AM HUNGARY" or "I WANT TO GO TO THE WASHROOM"

and the person can set which button should say which command. And the long press can show different-different commands so the combinations can be many the aim for me to build this framework is to encourage people who cannot speak or are facing difficulties speaking can communicate with other people and not fall victim to loneliness, Depression, or low morale.
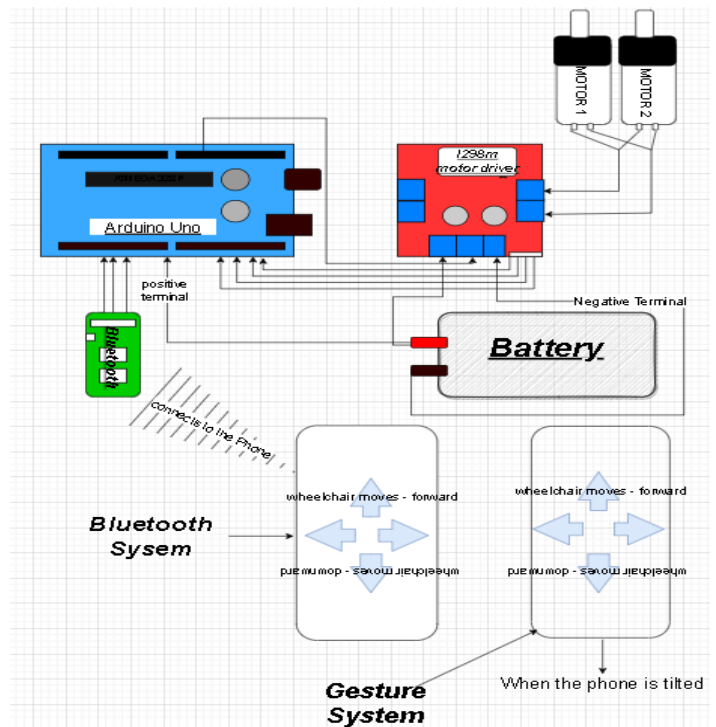

Fig -2: Block-Diagram for *Gesture & Bluetooth Frameworks*.

heart disease which is one of the *most common problems in India* after Tuberculosis so we have connected a pulse rate sensor and the temperature sensor to the Arduino UNO board. And we have put in a GSM Sensor which helps in a very crucial task of getting all the outputs delivered to the patient's Doctor by which the doctor can get day-to-day or even Hour to Hour depending on the patient's conditions.
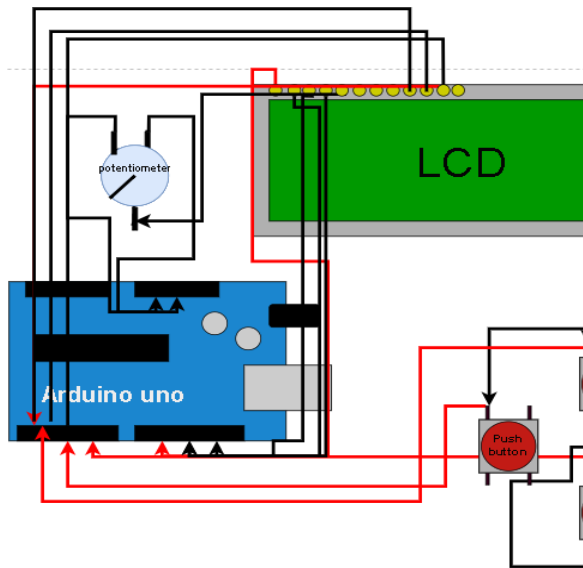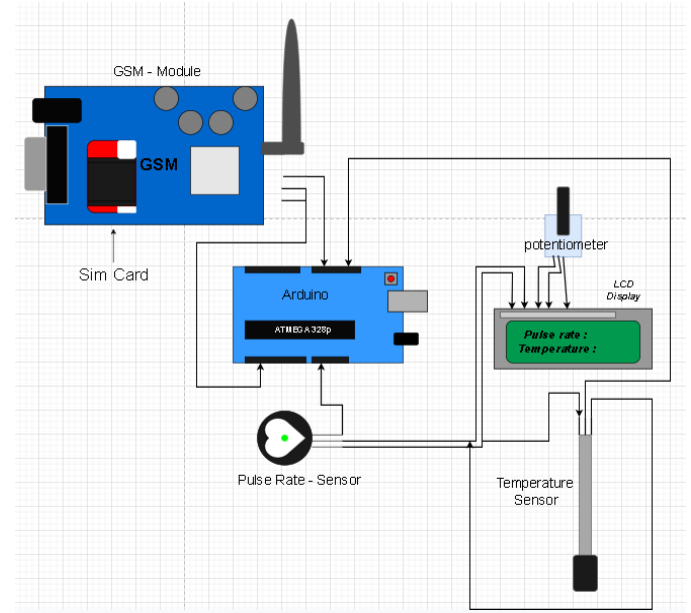
Fig -3: Block-Diagram for *Speaking Aid Framework*

In a nutshell, The Speaking Aid Framework is designed to help mute people or people facing trouble communicating communicate

2.3 Object Detection Framework

This is one of the additional features offered in this robot the problem statement Which is getting solved by this is when any object comes very close to the wheelchair will automatically stop and this framework is needed for example when stairs come very close to the wheelchair so then the wheelchair automatically stop and the motor will stop working unless the wheelchair is taken back.

2.4 Entertainment Framework

This is one of the socially inclined projects we have built this framework to keep the patient entertained and not just entertainment. Our Pod can also be used to set alarms and set when the patient has to eat their medicine.
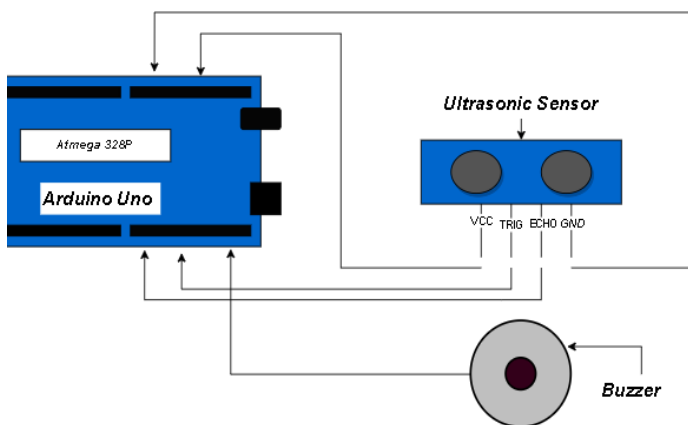

Fig -4: Block Diagram for *Object Detection Framework*

Fig 5: Block Diagram for **Health Care Framework**

3. Conclusion

So our made project is specially designed to give Aid or cater First the Senior Citizens Which are in need of medical attention and are Losing Their Mobility and For The Disabled People Our Wheelchair is also made to give aid for the People who are suffering from disabilities such as not being able to speak, Hear, Walk Etc. so the main and sole objective of our Wheelchair is to Provide aid to the people in need so our Project

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Prototype Model