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NON-AMBULATORY INDIVIDUAL LOCOMOTION WITH VOICE CONTROL SYSTEM

Sharmila V[1], Kalai Selvi D.M[2].,Ezhumalai P[3], Uppalmurthy Shashank[4], Vela Ganesh[5] Padiri Venkat sai[6]

[1,2]Assistant Professor, [3] Professor and Head, [4,5,6] Student ,
Department of Computer Science and Engineering
R.M.D. Engineering College (Autonomous), Chennai

Abstract-- Nowadays, a large number of countries are putting great emphasis on smart technology. In order to compete with other nations across the world, our Prime Minister of India has also launched the missions of Smart India and Digital India. Physically challenged people and the elderly are now experiencing challenges, not people who are able to. A smart wheelchair is one that can move on its own at the user's direction, reducing the need for the wheelchair user to exert physical power to propel the wheels. Furthermore, it enables those who are physically or visually impaired to go from one place to another.

INTRODUCTION

One of the most popular mechanical devices in the world is the wheel chair, which is used by elderly or physically disabled persons. Yet, the user requires a hand to move in order to use this. Data show that 0.655 billion individuals, or 15% of the world's population, have some form of physical handicap. Wheelchairs with joystick controls are frequently used throughout the world. But the difficulty is that handicapped people having issues with finger movement are unable to control the joystick since it requires manual control. The suggested system intends to build a voice-controlled wheelchair with a joystick as an optional feature because voice communication is the most prevalent kind. In crowded situations, it is possible to use a joystick instead of hearing voices clearly. It has a treatment machine to help the crippled person's limbs and prevent numbness from being brought on by prolonged rest. All user-specified instructions are handled by Arduino. The Arduino itself has built programmes that serve as instructions for each and every direction.

LITERATURE SURVEY

A technology that helps physically disabled people who can't move on their own was proposed by Voice Based Wheel Chair for Physically Challenged. Speech recognition is used by connecting the wheelchair, microcontroller, and speech recognition kit. The system offers a microphone so that the user may issue orders. The commands are delivered to the microcontroller via HM2007, which registers them. According to the instructions from the microcontroller, the wheelchair's motor driver operates it. People with locomotor disabilities can benefit from a notion introduced in the Wheelchair for Physically Handicapped Individuals with Sight and Voice Control. Eye movement and voice instructions are used here to operate the wheelchair. A head mounted camera is used to detect eye movement. corresponding output signals supplied to the wheelchair's motor for control.

METHODOLGY

The procedures or methods used to implement the intended prototype successfully are referred to as the methodology. To control the wheelchair's movement, a circuit with a microcontroller, voice shield, andBluetooth modules will be connected to the wheelchair. Both voice commands and an android the wheelchair will be controlled via a mobile app. The vocal commands will provide options for moving left, right, forward, and backwardA wheelchair's mobility is managed by controlling motor movements. These

motors' direction of motion and the user will submit voice instructions and these commands will be sent to the receiving side via Bluetooth controller. Two wheelchair control methods are available in the application. 1. Touch controls 2. voice command If touch control is used, the user must touch the buttons on the graphical user interface to instruct the controller.

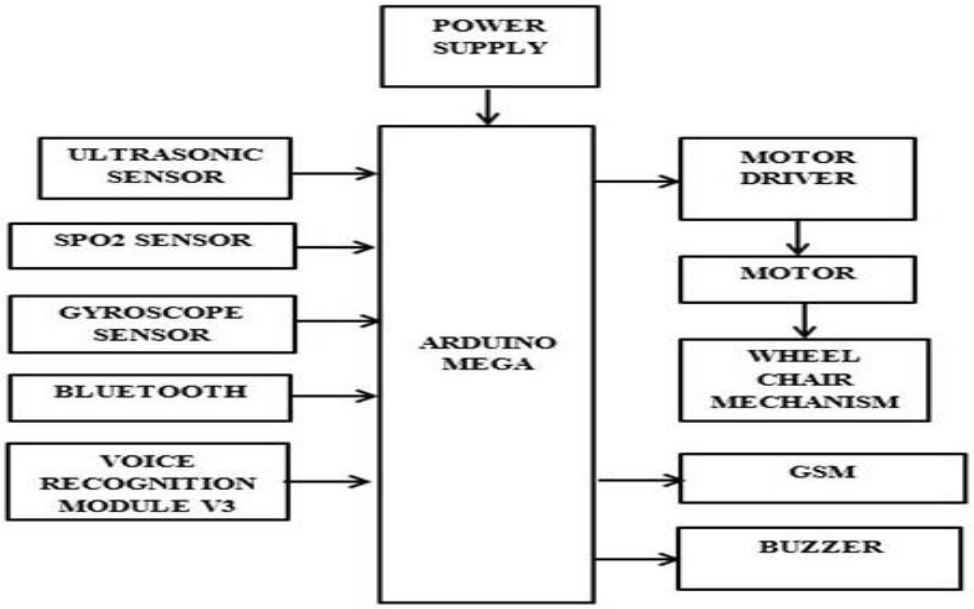

Fig 1: System Hardware Design

The pieces of the voice-activated automated wheelchair are as follow

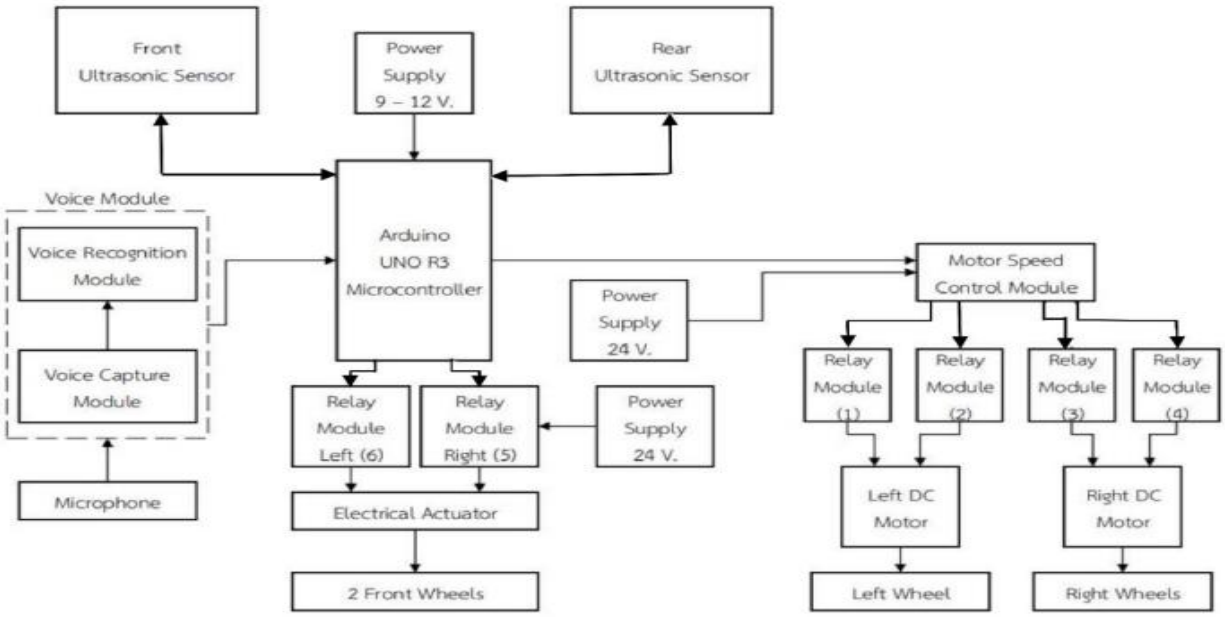

Fig2: Schematic diagram of the voice controlled automatic wheelchair.

The Arduino Uno is powered by a 12V battery at a controlled 5V. The motion control is carried out via a mobile application, which is connected to the Bluetooth module and the device. The programme accepts gestures or voice commands as input. For voice control of the model and command recognition, Google Voice Search Engine is employed. The smartphone's gyroscope sensor is used for gesture control. depending on the Bluetooth Module's input.

S. No	Input (what speakers will speak)	Output (wheelchair performance)
1	Left	Moves left
2	Right	Moves Right
3	Forward	Moves Forward
4	Backward	Moves Backward
5	Stop	Stop Moving

IMPLEMENTATION DETAILS

Voice Recognition Module is one of the appropriate modules that properly describes the prototype's process. GPS technology, a Wi-Fi module, and an Infrared sensor Firebase; Location Tracker Application; Motor driver Module. In implementation we have been used the flow charts of machine performance and motor performance

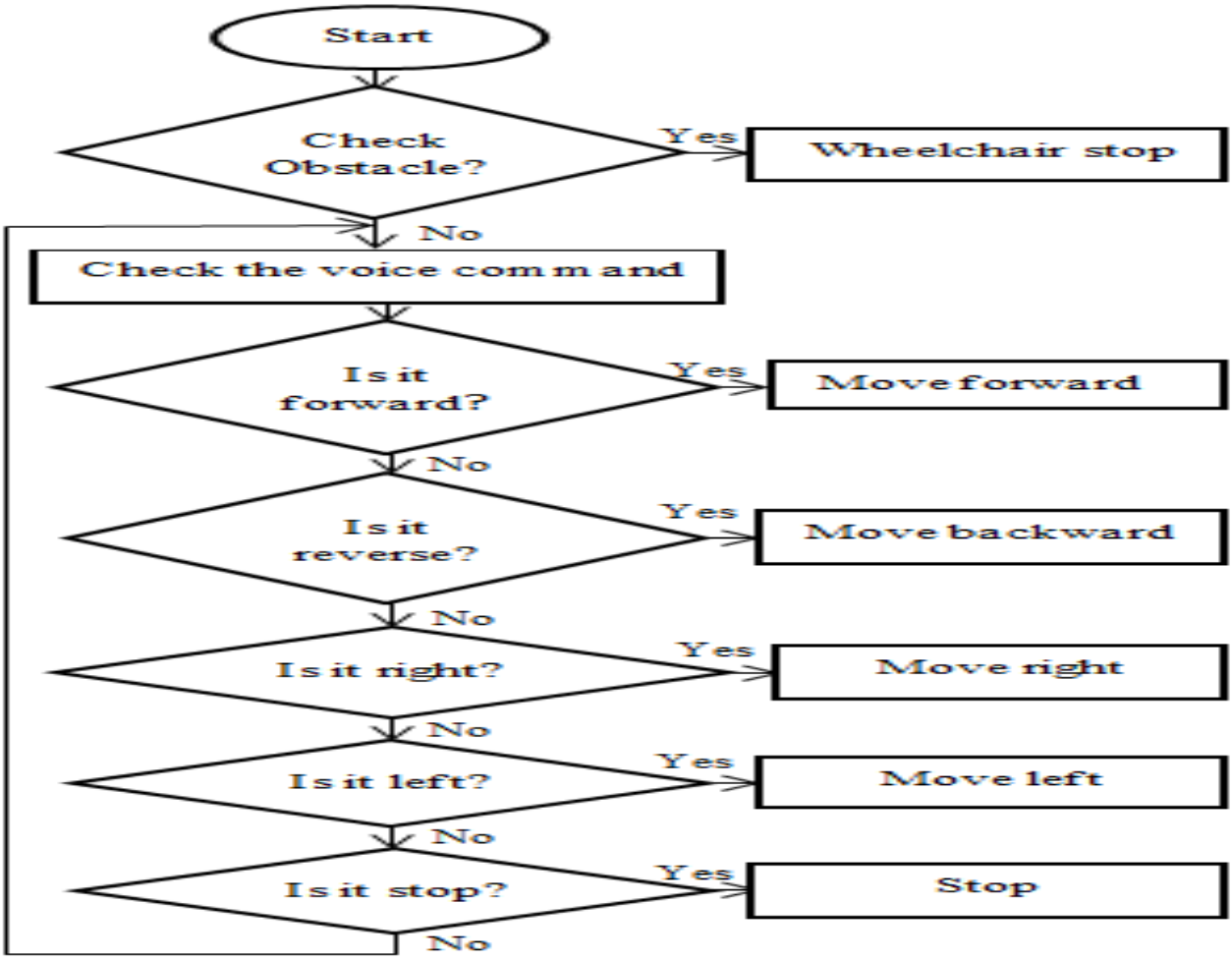

Fig3: Flow chart of motor direction of the wheelchair

Our solution uses GPS to track the whereabouts of persons with disabilities who often move about in wheelchairs. The GPS module we used to obtain the satellite coordinates.

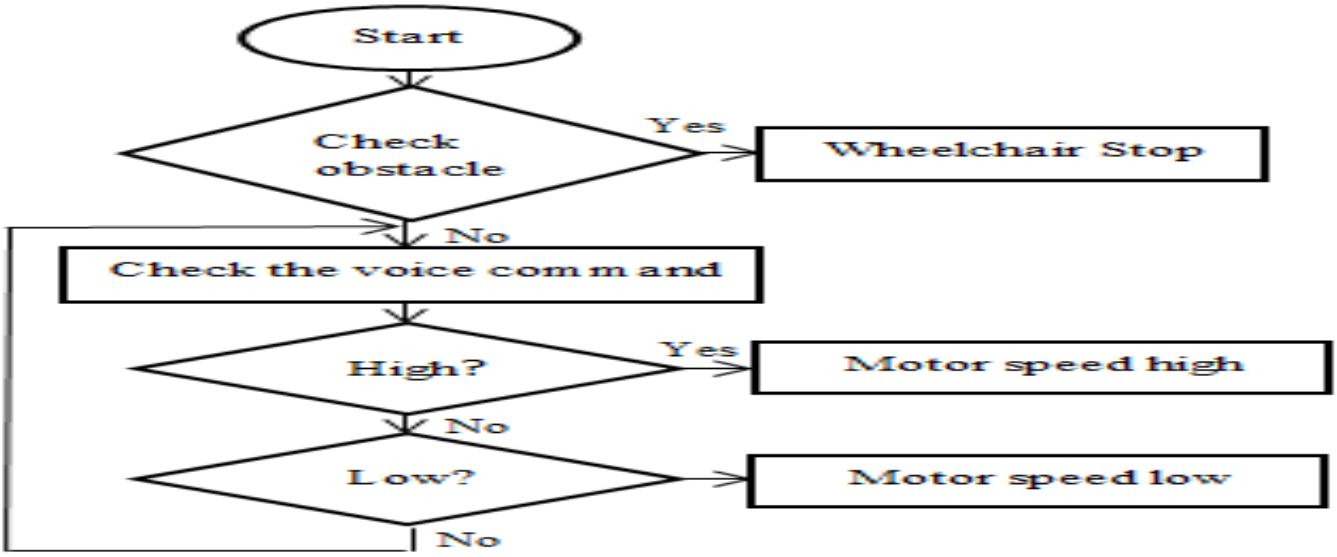

Fig. 4. Flow chart of the speed control of the wheelchair

RESULTS AND DISCUSSIONS

A microphone is first employed as an input device. After being processed, the voice signal is sent to the Arduino Uno board. Arduino transforms the orders into signals that the motors can understand and use to control the prototype's movement. The setup includes an ultrasonic sensor, power supply. The speech module is initially trained using four voice commands. The Arduino Uno's built-in Bluetooth module is then used to transmit the commands. In order to carry out the associated duties, the Arduino examines the signals pertaining to the commands and compares them with the stored commands. The wheelchair's orientation and its range of motion are described below. 1. Forward: Forward is selected on both motors. 2. Reverse: Reverse is engaged on both motors. 3. On the left, Motor 1 is not moving, while Motor 2 is moving. 4.Right: Motor 2 is halted and Motor 1 is in the forward position. 5.Stop: The two motors come to an end. When a spoken instruction is picked up, the prototype is directed in that direction.

Fig. 4. *LCD Display output for Forward Input*

CONCLUSION

The misery of live people must be lessened if we are to improve the world. For many years, technological researchers and scientists have been working to develop new surveillance technologies. In this essay,

we've modelled a wheelchair-moving assistance system for people with physical disabilities who need help. The technology allows voice commands to manoeuvre the wheelchair. Also, the patient may voice-command their wheelchair's pace. Also, a tracking system that uses an Android app to track the patient's present position has been developed, making our solution quick, efficient, and user-friendly. A big consideration is how the hardware is positioned inside the wheelchaircomplete use. a sensor for ultrasound. The prototype begins to move as soon as the user turns it on, and any impediment that is anticipated to be within a specific range will be picked up. Older persons and those with disabilities have contributed to the suggested system because of their independence.

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