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VOICE CONTROL BASED INTELLIGENT WHEEL CHAIR WITH GSM & GPS TRACKING

LAHARI MURIKI[1], MAROJU SANJANA[2], PABBOJU SHIVANI[3], Dr.K.SUDHAKAR[4]

[1,2,3] UG Students, Department of ECE, ***Malla Reddy Engineering College for Women (UGC-Autonomous) Maisammaguda, Hyderabad***, Telangana, India.

[4] Associate Professor, Department of ECE, ***Malla Reddy Engineering College for Women (UGC-Autonomous) Maisammaguda, Hyderabad***, India.

ABSTRACT:
This paper focuses on the development of an intelligent wheelchair for application to physically disabled persons. Freedom of mobility is a dream for every person with physical disability especially in the case of quadriplegics, those people who are paralyzed below neck and in case of multiple sclerosis patients. Though many types of mobility equipment are available for the disabled for their independent mobility, no efficient devices have yet been invented for the independent mobility of quadriplegic and multiple sclerosis patients. The quadriplegic and multiple sclerosis patients cannot drive a joystick operated wheelchair which is the only type of powered wheelchair which is commercially available. Quadriplegia and multiple sclerosis is cureless. This paper describes the sincere devotion to design a powered wheelchair with particular features that helps the above patients to move independently. Safety is our first priority, so we use ultrasonic sensors in order to detect the depth. This powered wheelchair is controlled by the joystick as well as speech of the user. This wheelchair can be easily driven to desired direction with minimum effort. The user requires minimum training to use this mobility equipment. Technically the wheelchair is integrated with an ultrasonic sensor for depth detection, a joystick, voice recognition circuit to recognize the voice, a microcontroller which can be programmed supporting these hardware components. Powered wheelchairs with the standard joystick interface are unable to control by many people. A voice controlled wheelchair can provide easy access for physically disabled person who cannot control their movements especially the hands.

Keywords: IOT, LCD, TELNET, Fault, voltage sensor.

1. INTRODUCTION

Wheelchair is the most widely used mechanical device all over the world, which is used by physically disabled patients or aged people to move. For normal wheelchair, the user needs an extra supporting person or self-assistance by hand to move on. Statistics show that around 650 million people which is about 15% of the world population are suffering from some sort of physical disability. With the growing number of population, the number of physically disabled and elderly patients is also increasing as well as the

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demand of automated wheelchair. Due to technological development, mostly joystick controlled automated electric motorized wheelchairs are widely available throughout the world. In developing and under developing countries, these wheelchairs are neither very much available nor much cost effective. Independent mobility is an aspiration for every person with some or the other physical disability especially in the case of quadriplegics and multiple sclerosis. These are the patients who are paralyzed below neck and people suffering from back bone problem and knee joint problem. People with disabilities meet barriers of all type. We know that technology is manual for wheelchair but as per survey more than 70 percent of manual wheelchair users will develop shoulder pain at some point in their life. But the quadriplegic and knee joint patients cannot move any of the limbs below the neck. Wheelchairs can be designed for various purpose like wheelchairs can be handled by hands, mouth, or any other functioning. Smart wheelchair is a combination of standard driver modules and collection of sensors with a user interface by using android app. This feature makes it useful for those disabled persons.This paper proposes an integrated approach to real time detection, tracking and direction recognition of hands, which is intended to be used as a human-robot interaction interface for the intelligent wheelchair. The most common image of disability is the people in wheelchairs. Wheelchairs are used by people who find themselves unequipped to move without external aid. The special needs of the elderly may differ from that of a physically challenged person or a large individual but they all have "special needs" and often require some assistance to perform their daily routine. The physically challenged people, who use a normal wheelchair for navigation, usually require an external person to move around. In this busy world, the elderly people may be left alone at home and also may not find an apt person for external help. Here comes the need of an automated home navigation system, which consists of a wheelchair which can be used by the elderly and the physically challenged people without the help of an external person. The proposed paper can be operated using the gestures of the provided android mobile phone. Patients involved in physical injuries and disabilities with good mental strength struggle to get through places using the conventional hand powered wheelchair. 6 (3) conformity of style throughout a conference proceedings. Margins, column widths, line spacing, and type styles are built-in; examples of the type styles are provided throughout this document and are identified in italic type, within parentheses, following the example. Some components, such as multi-leveled equations, graphics, and tables are not prescribed, although the various table text styles are provided. The formatter will need to create these components, incorporating the applicable criteria that follow.

2. RELATED STUDY

Open Circuit Fault When there is a break in the conductor of the cable, it is called open circuit fault of the cable. The open circuit fault can be checked by megger. For this purpose, the three conductors of

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the 3-core cable at the far end are shorted and earthed. Then resistance between each conductor and earth is measured by a megger. The megger will indicate zero resistance in the circuit of the conductor that is not broken. However, if the conductor is broken, the megger will indicate infinite resistance in its circuit.

Short Circuit Fault When two conductors of a multi-core cable come in electrical contact with each other due to insulation failure, it is called short-circuit fault. The two terminals of the megger are connected to any two conductors. If the megger gives zero reading, it indicates short-circuit fault between these two conductors. The same step can be repeated for other conductors taking two at a time.

Earth Fault When the conductor of the cable comes in contact with earth, it is called earth fault or ground fault. To identify this fault, one terminal of the megger is connected to the conductor and the other terminal connected to earth. If megger indicates zero reading, it means the conductor is earthed. The same procedure is repeated for other conductors of the cable [4,6].

3. AN OVERVIEW OF PROPOSED SYSTEM

This proposed system designed by of an Arduino based voice controlled automated standing wheelchair. This system is powered by Arduino Uno, it is equipped with the LCD display and Bluetooth module, a GSM and GPS module, DC motor and Standing wheel chair mechanism. The system is designed to control a wheel chair using the voice of person. The objective of this project is to facilitate the movement of people who are disabling or handicapped and elderly people who are not able to move well. The goal of this system will allow certain people to live a life with less dependence on others for their movement as a daily need. Speech recognition technology is a key technology which will provide a new way of human interaction with machine or tools. Therefore the problems that they face can be solved by using speech recognition technology for the movement of wheel chair. This can be realized and optimized with use the smart phone device as an intermediary or interface. In this project interfaces has been designed therefore to develop a program for recognize speech also controls the movement of chair and an application which can handle or manage the graphical commands. This project uses arduino kit Microcontroller circuit and DC motors to create the movement of wheel chair the user can input command to operate a wheel chair to achieve a desire movement. This system also has an emergency feature; the user needs to press the help button to for an emergency. This system automatically senses the GPS coordinate to the care taker the design is developed with a voice recognition system, which allows the physically disabled person to control the standing wheelchair by voice command that have issues in hand movement due to ageing or paralysis for joystick controlled wheelchairs. After powering the system on, the phone number gets configured. Then patient can move by using voice commands. Patient can use forward and backward voice commands to move in front or back direction and to stop on some certain place they can press stop

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button, and to turn left or right there are left right button and to make the chair stand, the patient can press stand button and to come back to the same position patient can repress the same button. The design also provide some additional features such as fall detection for the safe movement and a GPS based navigation system for tracking and sending notifications to the caretakers increase the usability of the automated wheelchair system. In case of emergency patient can press help button. As the patient will press the help button the system will send the GPS location to the care taker. In this way, tis system can be used to help the paralysis or leg disable patient.

Standing wheel chStanding wheelchairs are Abbreused by people with mild to severe disabilities including: spinal cord injury, traumatic brain injury, cerebral palsy, spina bifida, muscular dystrophy, multiple sclerosis, stroke, rett syndrome, post-polio syndrome and more. Standing chairs are used by people with both paraplegia and quadriplegia, since a variety of standing options are available to accommodate for mild-to severe disabilities. Designing a simple and efficient automatic speech recognition system for isolated command words to satisfy the motion control of an electric motorized standing wheelchair for differently abled persons is the interest of this project. The processing units (the speech kit and the microcontroller) are directly attached to the wheelchair in one package that made the design representing a complete autonomous and smart wheelchair. The speech recognizer is tested to prove its performance to generate exact movement of the chair. It proved a recognition rate of above 90%. This project elaborates the design and construction of Smart Standing Wheelchair with the help of Bluetooth Module. The circuit works properly to move as the command given by the user. After designing the circuit that enables physically disabled to control their wheel and standing mode using an android application in their smart phones and it has also been tested and validated. The detection of any obstacle is successfully controlled by the microcontroller. As the person switches on the circuit and starts moving. This proposed system contributes to the self dependency of differently abled and older people. Voice control method through Bluetooth module also implemented for the person having upper limb injury. This wheel chair is more efficient and cost effective compared to other methods of control. Different types of therapy facility create a new revolution with this automated system. Our proposed design has shown evidence that standing wheelchairs may provide specific health benefits. Some of these health benefits include improved circulation, urinary health, bowel function and bone density.

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Standing wheelchairs may also improve overall quality of life and independence among users. The aim of the project is to help handicapped and elderly people. To attain this we use voice recognition techniques. The voice recognition and gesture methods work very quickly whenever user use these features the sensors reacts fast and follow the commands immediately. So, we can say that the system we make is a life changer for handicapped and elderly people.

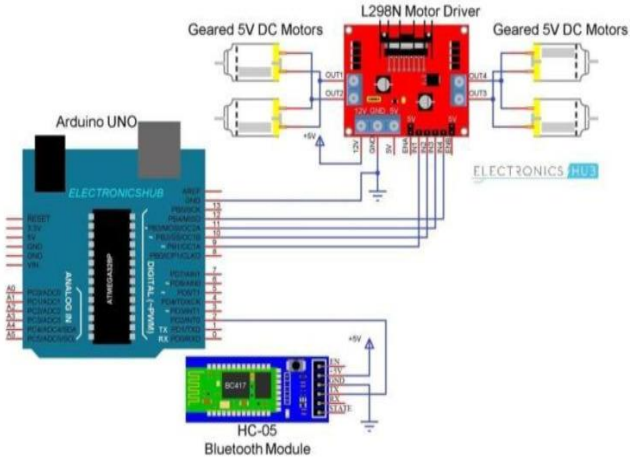

Fig.1. Proposed system model.

4. CONCLUSION

We conclude that the developed voice based control of standing wheel chair is tested and works satisfactorily in an indoor environment with minimum assistance to the person suffering with Quadriplegia or Paraplegia. It has a good response with voice recognition activating the motors connected to the wheels of the chair. This paper presents a new voice controlled wheelchair with many advantages such as reduced complexity, easy controlling, low cost and great reliability compared to other conventional wheelchairs. The proposed wheelchair can be used in many applications such as hospitals, old age homes and airports etc. The main objective of this product is to make the helper life easy and to make sure the patient is not hurt during the process of treatment. This product eliminates the step of standing patient from wheelchair and vice versa as handling of old age people is very difficult. It makes the patient comfortable when sitting for a long time. This will reduce the effort of the caretaker and provide a safer transfer for the patients in hospitals. Our most modern day technologies use sensors such as vibration and voice recognition to take interactive input and in this project we also have tried to make the interactive wheelchair and close to human.

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