VOICE CONTROLLED WHEELCHAIR WITH OBSTACLE DETECTION

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ABSTRACT

This paper presents a wheelchair which can be controlled through voice. Many disabled people who cannot do the movement of their hands and legs are dependent on others to move from one place to another thus this wheelchair will help them to move using their voice command and will make them independent. Also this wheelchair will have a camera mounted which will keep a check on obstacles and the wheelchair will automatically stop in that case.

KEYWORDS: Arduino, Voice Control, Obstacle Detection, Voice Command.

I. INTRODUCTION

It is very difficult for people with arms and hand impairment to use a normal wheelchair as their hands are not capable of operating the normal wheelchair and cannot move it to any direction. Therefore, voice controlled wheelchair is designed to overcome this problem faced by such people and enable them to operate the wheelchair themselves. The wheelchair will be operated using the voice commands through the given input.

By having a wheelchair control system people will no longer be dependent. The wheelchair control system employs a voice recognition system for triggering and controlling all its movements. By using the system, the users are able to operate the wheelchair by simply speaking to the wheelchair’s microphone. The basic movement functions include forward and reverse direction, left and right turns and stop. Apart from that people can have a check on speed also by using fast and slow command. Also this wheelchair will have a camera fitted on its leg which will automatically stop the wheelchair if any obstacle is identified.

II. METHODOLOGY

This project is a system which will help the disabled people not to rely on any other person for moving from one place to another and can move themselves using their own voice.

The main part of the design is to control the motion of the wheel chair. There are four conditions of motion are considered, moving to forward, moving in reverse direction, moving to the left and moving to the right. For speed control commands like fast and slow can be used by the user.

The wheelchair will be operated using the voice commands through the given inputs. Arduino will take care about all the directions the person wants. The instruction for each and every direction is written in the form of program in the Arduino itself. The voice commands to the wheelchair will be given by the microphone placed as per the user comfort. The already written programs in the Arduino helps Arduino to convert this voice commands into considerable output and the wheelchair will move accordingly.

When the voice is detected, the wheelchair can be controlled to move in that direction by giving commands to the wheelchair. These commands are transferred to the wheelchair which are used to drive the left or right motor of the wheelchair.

Also there will be a camera fitted on the legs of the wheelchair which will identify the obstacle in the path of wheelchair and the wheelchair will automatically stop in that case if user is unable to give command immediately.
III. RESULT AND DISCUSSION

Voice controlled wheel chair provides a system and method for voice recognition that provides greater accuracy and efficiency. Voice controlled wheel chair is all about a system which is dedicated to help disables by providing a facility to operate their wheel chair through their voice more accurately. The project uses different commands like forward, reverse, left, right, stop and to control the speed we have commands like fast and slow. The system keeps a check on security and wellbeing of the person therefore obstacle detection is used to immediately stop the wheelchair on identifying any obstacle in its path.

IV. PROPOSED SOLUTION

The proposal is to deploy a system in the wheel chair so that it can be operated using the voice. More specifically the user and the admin's voice only. A system which can identify various commands like forward, reverse, left, right, slow, fast etc. through the microphone fitted on the handle of the wheelchair and perform appropriate
operations in real-time. Also the wheelchair will stop immediately in case of any obstacle identified by the camera fitted on the legs of wheelchair.

V. CONCLUSION

This system is a Real-Time Voice controlled Wheelchair for the physically disabled person. This system is designed to operate the wheelchair based on the voice of the user and control the movement according to the command given by the operating person. Only the person who uses the wheelchair and the admin is allowed to control the direction using his/her voice because sometimes the other person can lead to an accident. The commands would be given through a unilateral mic and would be converted into binary format by voice recognition kit. These command would be performed within seconds. On the whole its basic operation would be left, right, stop, forward, backward and slow and fast for speed control. And the camera fitted on the legs of wheelchair will identify the obstacles and will stop automatically if any obstacle is identified.

VI. FUTURE SCOPE

In future further advancement in this wheel chair are possible by decreasing the power requirements of the wheel chair or finding a way to automatically charge the battery with the help of motion of the wheel chair or solar panel. Also some more commands can be added to this wheelchair to make it more efficient for the person.

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VII. REFERENCE