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Inteligent Wheel Chair for Handicap People

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Abstract: ***this paper is automatic wheelchair for physically disabled person. A dependent and ultrasonic and infrared sensor system has been integrated in this wheelchair. In this way we have obtained a automatic wheelchair which can be driven and with the possibility of avoiding obstacles by using infrared sensors and down stairs or hole detection by using ultrasonic sensors. This wheelchair works on accelerometer movement and which will helpful for the person whose limbs are not working. Accelerometer can be attached to any movable part of body like hands, head etc. It has also provision of joystick for disabled people who can easily move his/her hand. Electronic system configuration, a sensor system, a mechanical model, accelerometer control and joystick control are considered. It enables a disabled person to move around independently, which is interfaced with motors. The model of the wheelchair is made using a micro-controller, chose for its low cost, in addition to its versatility and performance in mathematical operations and communication with other devices. The system has been design on cost effective way, so any needy person/company can purchase it. Here we use voice reorganization technology also.***
Keywords: Joystick, Sensor, Transmitter, Receiver

I. INTRODUCTION

Most of us do not know about this but there is a type of disability in person who was not use any of their limbs. This kind of disability is called quadriplegia and the person with this disability is called quadriplegics. This kind of reason person have disability like stoke, high blood pressure, degenerative disease of bones and joints and cases of paralysis and birth defect. Sometimes it is also due to accidents. The person with that type of disabilities who cannot perform his/her daily tasks. According to the level of disability a person can get his ability of movement by using medical equipment's.

Fig .1

Many type of wheelchair available in market which was operated on mostly on joystick. But they are not up to the mark for elderly people. Some hands free are also introduced with work. But they also affected by the noise and light near the person. By the noise and light around the person. By the use of eye tracking and blinking the eye sight also affect. Two medical devices with electronic system are introduced to improve the ability of the person inside and outside conditions.

II. OBJECTIVES

To develop a voice controlled wheelchair by using Visual Basic for wheelchair control.
To introduced the voice user as an input signal to control the movement of wheelchair.
Provide the facilities for disabled people and elderly people who can't move properly

III. LITERATURE SURVEY

Several studies have shown that the independent mobility; which is included power wheel chair, manual wheelchair and walker access the benefit to both children and adults. Independent mobility increases vocational and educational opportunities, reduces dependence on family members and other, and raises feelings of self-reliance. For young children, independent mobility serves as

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the foundation for much early learning. Non ambulatory children lack access to the wealth of stimuli afforded selfdependence children. This lack of exploration and control often produces a cycle of deprivation and reduced motivation that leads to learned helplessness.

For adults, independent mobility is an main aspect of self-system and plays a pivotal role in "aging in place." For example, if older people find it increasingly difficult to walk or wheel themselves to the toilet, they may do so less or they may drink less fluid to reduce the frequency of urination. If they become unable to walk or wheel themselves to the commode and helper is not available in the home when needed, a move to a more enabling environment (e.g., assisted living) may be necessary. Mobility limitations are the leading cause of limitations among adults, with an estimated prevalence of 50 per 1,000 persons age 18 to 44 and 188 per 1,000 at age 85 and older. Mobility difficulties are also strong predictors of activities of daily living (ADL) and instrumental ADL disabilities because of the need to move to achieve many of these activities. In addition, impaired mobility often results in decreased opportunities to socialize, which leads to social sequester, anxiety, and glumness. While the needs of many individuals with disabilities can be satisfied with traditional manual or power wheelchairs, a segment of the emasculate community finds it difficult or impossible to use wheelchairs itself.

IV. COMPONENT OF SYSTEM

Accelerometer An accelerator seen like a simple circuit for some larger electronic equipment. Despite its humble look, the accelerometer consists of many different parts and works in many ways, two of which are the piezoelectric effect and the capacitance sensor. The piezoelectric effect is commonly use form of accelerometer and uses microscopic crystal structures that become stressed due to accelerative forces. These crystals developed a voltage from the stress, and the accelerometer read the voltage to find velocity and orientation.

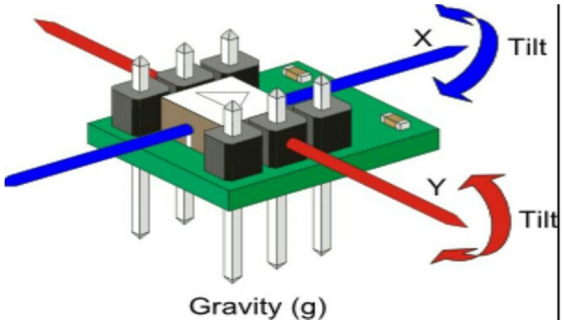

Fig .2 Accelerometer

The capacitance accelerometer senses changes in capacitance between microstructures located next to the device. If an accelerative force moves one of these structures, the capacitance will change and the accelerometer will translate that capacitance to voltage for interpretation.

Fig .3 Ultrasonic sensor

Ultrasonic Sensor Ultrasonic transducers are transducers that convert ultrasound waves to electrical signals or vice versa. Those that transmit/ receive may also be called ultrasound transceivers; many ultrasound sensors barring being sensors are indeed transceivers because they can both sense and transmit. These sensor work on similar to the principle of transducers used in radar and sonar systems, which calculated attributes of a goal by interpreting the echoes from radio or sound waves, respectively. Active ultrasonic

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sensors generate high-frequency sound waves and calculate the echo which is received back by the sensor, count the time interval between sending the signal and getting the echo to find the distance to an object. Passive ultrasonic sensors are commonly microphones that sense ultrasonic noise that is present under certain conditions, convert it to an electrical signal, and send it to a computer.

A short ultrasonic pulse is transmitted at the time 0, reflected by an object. The senor receives this signal and transfer it to an electric signal. The next pulse can be transferred when the echo is faded away. This time period is called cycle period. The recommend cycle period should be no less than 50ms. If a 10μs width trigger pulse is send to the signal pin, the Ultrasonic module will output eight 40 kHz signal and sense the echo back. The measured distance is proportional to the echo pulse width and can be find by the formula above. If no obstacle is find, the output pin will give a 38ms high level signal.

Fig .4 Joy-Stick

Joystick A is an input device have a stick that fix on a base and reports its angle or direction to the device it is controlling. A joystick, also known as the control column, is the main control device in the cockpit of many civilian and military aircraft, either as a center stick or side stick. It often has another switches to control various aspects of the aircraft's flight. Joysticks are used to control video games, and usually have one/more push-buttons whose state can also be read by the computer. Joysticks are also used for controlling machines such as cranes, trucks, underwater unmanned vehicles, wheelchairs, surveillance cameras, and zero turning radius lawn mowers. Miniature finger-operated joysticks have been adopted as input devices for smaller electronic equipment such as mobile phones

Fig .5 Planetary Wheels

Planetary wheel the main property of the continuous stair-climbing wheelchair is that it only has set of supporting device, the

wheelchair mount on this supporting device for continuous motions. According to the motion actuating mechanism it is divided into planetary wheel mechanism and tracked mechanism, and the tracked mechanism is more essential which is used much widely in stair climbing anti-riot robot.

V. COMPARE WITH ORDINARY WHEEL CHAIR

This wheel chair have an ability to perform multiple operations without need of any other person. The physically disabled person can move independently to his/her work.

VI. FUTURE SCOPE

From the above obtained results, we conclude that the developed head gesture based control of 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 MEMS activating the motors connected to the wheel chair. The response and distance covered by wheel chair can be further improved if the gear system connected to motors are replaced by crank and pinion joint which has less friction and mechanical wear &tear. In future we would work on this concept to improve the response and embed more sensors like proximity, ultrasonic, GPS to guide the impaired people in much more better way and use this wheelchair even under outdoor conditions

VII. ADVANTAGES

Easy and convenient.
Owning a power wheelchair.
Due to a disability or injury, any wheelchair or power chair has a seat, foot rests and four wheels.
Freedom to disabled person to move anywhere.

VIII. APPLICATIONS OF SMART WHEELCHAIR

Sports, Hospitals, Physically handicapped individuals

IX. CONCLUSION

We are introduce automatic wheelchair which has much more advantages. It is operating in three different modes i.e. joystick mode, accelerometer mode. Also there two types of sensors which improve accuracy of wheelchair. This Wheelchair will be economical and can affordable to common person. We can also add new technology in this wheelchair. A system can reliable to recognition of speech and face has been designed and developed. This system can be made high efficiency and effective if stringent environmental conditions are maintained. The setup for maintaining these environmental conditions will be a onetime investment for any real life equipment. The running cost of this system is much lower as compare to other systems used for the same purpose

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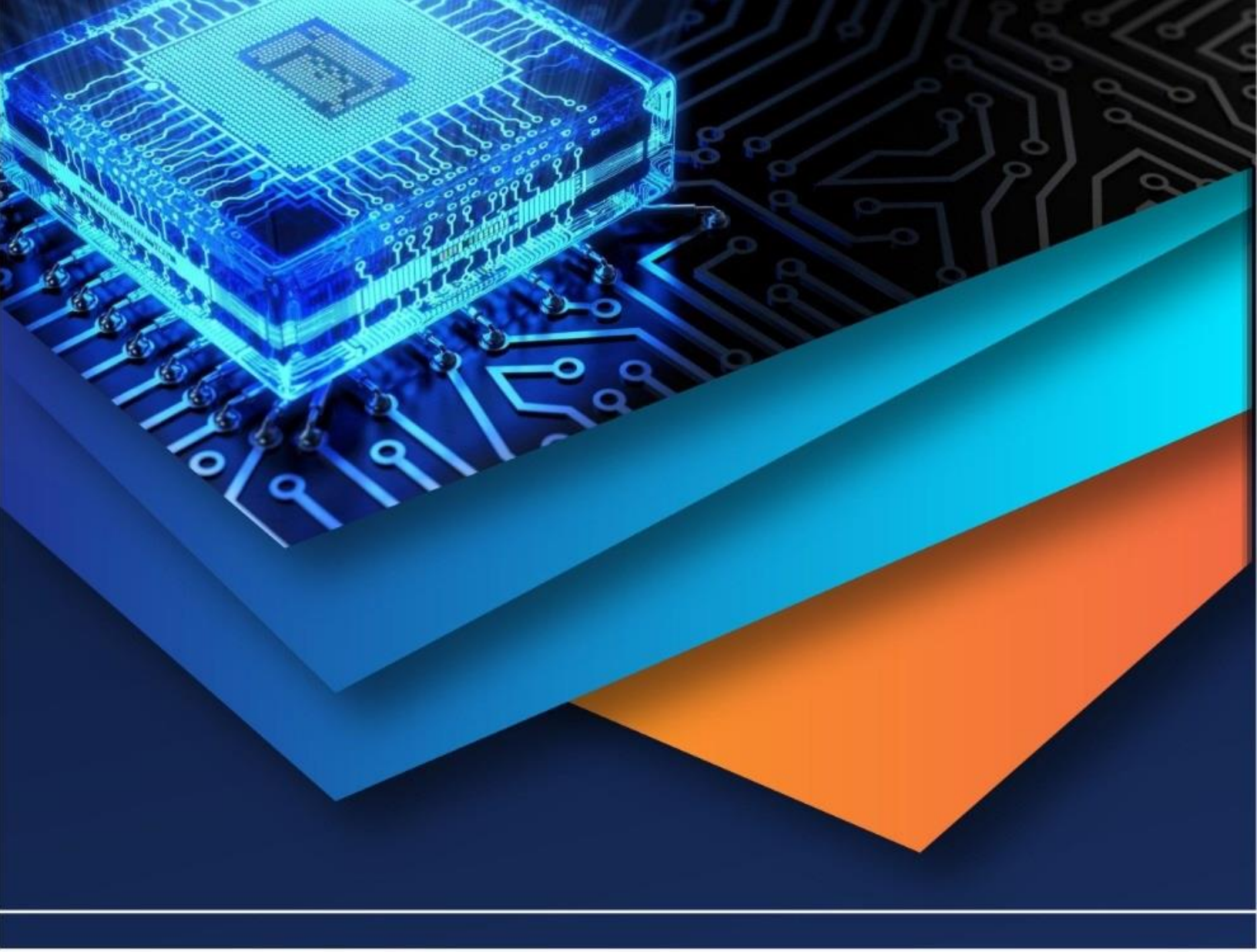

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