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INTELLIGENT WHEELCHAIR FOR HANDICAPPED PERSONS

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***Abstract*—**Smart robotic wheelchair has a great significance in life of a disabled person. With several merits, a wheelchair becomes a dilemma for a disabled person when comes to self-propulsion. This project describes an economical solution of robot control systems. The presented wheelchair control system can be used for different sophisticated robotic applications. The robotic wheelchair comprises of the features like sensing hindrances and circuitry to avoid colliding to obstacle. Implementing embedded systems solution on self-propelled wheelchair enhances upgradability. Physical disability is a curse to human life. The fundamental operation of the wheelchair to handicapped person with safe movement. For ensuring the safety of movement, obstacle sensing, crack detection and living being identification features have been included. Additionally, a controlled LCD has been provided considering the case of auditory disabled people. Access to control hone appliances has also been offered.

Keywords: **Arduino kit, Relay, DC Motor, IR sensor module and Accelerometer sensor**

1. INTRODUCTION

People with physical disabilities every time find it complicated to navigate through their house without the assistance of someone. But to navigate through one's own home without contribute of any one all time can be demoralizing for the person as well. It can be handled wireless methods. The future intelligent robotic wheelchair can learn the layout of its environment (hospital, rehabilitation center, hone, etc.) through a narrated, guided tour given by the user or the uses caregivers. Subsequently, the wheelchair can move to any previously-named location under voice command (e.g., 'Take me to the cafeteria"). This technology appropriate for people who have lost mobility due to brain injury or the loss of lines, but who retain speech. The technology can be enhanced with Tongue Motion Driver to move the chair by the movement of tongue which will be easier for totally paradise people. It can be modified by gesture technology or voice commanded technology. The technology can also enhance safety for users modified by caterpillar tracks which can be used through stairs.

The system comprises of two major units. The first unit is a simple user's of two hand gesture unit. The second unit is the wheelchair unit. The first gesture unit consists of ARM7 controller which monitors the motions of fingers and transmits the corresponding control signal to the wheelchair unit. The wheelchair unit also consists of ARM7 controller for controlling the movement of wheelchair. The second gesture unit consist of ARM7 controller the controller can detect the audio announcement [2].

The bright and innovative design will help for the handicapped person along with reducing life style of those types of patient. Our job will be too helpful for the users so far. For the revolution obviously this chair has to be further developed and manufactured. 'The world will see the continuous invention with pioneering Excellences [1].

Four fundamental requirements for self-governing operations for people with motor-impairments are Mobility, Ambient control, Health monitoring and emergency handling stands vital for transitioning to living independently. Blending the four above enlisted fundamental requirements and the solution presented in this paper will serve with great potential in becoming solid solution for real life problems of the motor impaired. This proposed embedded system solution is not limited to wheelchair implementation instead it can be further modified and elevated to varied robotic vision development [2].

The smart wheelchair based on eye tracking is presented in this paper. is not only represent the eye movement to control electrical wheelchair but also remotely to control some electrical device such as turn ON/OFF light and also to communicate with caretaker via sent message to smartphone. The smart wheelchair based on eye tracking could improve the quality of live to the disability person whose eye still is be used as normal [3].

The software simulation of solar power-driven Touch Screen Wheelchair by means of Bluetooth Module. The circuit works properly to move as the command given by the user. The detection of some obstacle is successfully controlled by the

ultrasonic sensor. This proposed system contributes to the self-dependency of differently disabled and older people. This paper discusses the Bluetooth technology, power electronics and design facilitated in the making of an easily operated, light weighted and relatively cheap vehicle with reduced manual effort and travel time. Our project would benefit 2.1 million handicapped all across the country [4].

2. OBJECTIVE

The primary objective of this work is to make the life easier, independent, productive and enjoyable with better movement technologies for the handicapped persons. To provide a strong detection of obstacle, crack, living being for sensing with different purposes for the user and to build communication level and provide home automation features for better life leading system are secondary objective of the project. This project enhances an ordinary powered wheelchair using sensors to perceive the wheelchair's surrounding, a speech interface to interrupts commands. These will play an important role in the future welfare society. The use of this chair encourages the view of the machine as a partner rather than as a tool. Implementation of infrared sensor which is used to sense the obstacles coming in path of robot.

3. PROJECTIMPLEMENTATION

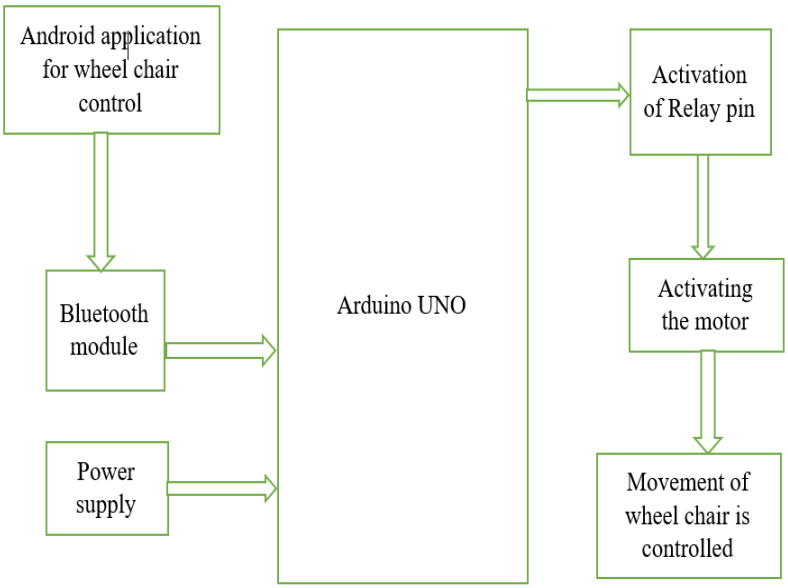

Fig 1 Block Diagram Of Wheel Chair Operations

WORKING: Bluetooth module is responsible to sense the direction from android smart phone application. This will be further response by connected and coded Arduino makes a controlling scenario through the connected control pins of relay which is connected to motor to control the movements of wheelchair as directed. For controlling the home appliances again Bluetooth module sense the power controlling direction via android application and repeat the sane procedure from the code.

Arduino kit: VIN: The input voltage to the Arduino board when it's using an external power source.
POWER SUPPLY: The regulated power supply used to power the microcontroller and other components on the board. The can cone either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.
Serial: O (RX) and I (TX). These pins are connected to receive (RX) and transmit (TX) TTL serial data.
Reset: Bring this line LOW to reset the microcontroller.
Relay: it is a electrically activated switch such relay can categorize into normally open or closed type. Such relay as 5 terminal pins which consists of pair of coil pins, a common pin, a normally open pin (NO)and a normally closed pin (NC) pin.

Motor: a DC motor is the most common type of motor. A dc motors normally have just 2 lids, one positive and one negative. If you connect thus 2 lids directly to a battery, the motor will rotate.

SOFTWARE and HARDWARE REQUIREMENTS
AURDINO SOFTWARE (IDE)
Accelerometer sensor
Ultra-sonic sensor
Arduino Uno
Relay
IR sensor module
Battery 12v
Bluetooth model

4. RESULT

Smart robotic wheelchair has a great significance in life of a disabled person. With several merits, a wheelchair becomes a dilemma for a disabled person when comes to self-propulsion. This project describes an economical solution of robot control systems. Finally implemented using Arduino UNO.

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