Touch Controlled Wheelchair For Patients And Physically Challenged Persons

T.Jyothi[1], K.Meghana[2], G.Mounika[3], M.Pavan Kumar[4], K.Pavan Chaithanya[5]
[1,2,3,4,5] *Department of ECE, Annamacharya Institute of Technology & Sciences, Tirupati-517520*

Abstract
This project will help physically challenged persons and patients to operate their wheel chair without need of second person. The main aim is to designing a wheel chair for physically disabled people using touch screen. This physically challenging wheel chair is a machine that allows the physically disabled person to change the direction of the vehicle according to his requirement without any other person's need. The direction of the vehicle can be changed with the inputs given by the user from the touch screen. The microcontroller continuously monitors its input pins and if it receives any input, it performs the task according to the user requirement. The user feels very comfortable with the touch screen. L293D is used as the motor driver interface between the microcontroller and the motors.
Keywords: Microcontroller,L293D Motor Driver

Introduction
The main objective of this project is to design and develop a system that allows the user to interact with the smart wheelchair with touch screen at different levels of control for obstacle detection and collision avoidance providing efficient management. This project introduces a new design model of wheelchair for physically disabled which can be used for moving from one place to another. The project provides a helping tool to the disabled and helps them move around. The wheelchair provides safety by adopting features such as obstacle detection for collision avoidance and hollow detection to avoid danger which they might encounter in their day-to-day life such wheelchair designed reduces dependency on caretakers and family members and promotes the feeling of self-reliance. The smart wheelchair avoids or stops in front of obstacles. Speed is often decreased to avoid minimum obstacle clearance; speed is reduced to allow wheelchair to approach closer obstacles/objects. Taking all in this in consideration we have decided to do a touch-screen operated wheelchair It is user friendly technology that operates on touch screen Less force is required for operation i.e., single finger is enough to operate a wheelchair. As touch screen technology is acquiring highest peak in various scientific as well as commercially developing products, its use in patient friendly devices like wheelchairs may result in improved quality of service.

Related Work :
1. Existing System:
Generally, in hospital for patients and physically challenged persons there is a need for usage of wheel chair. After the seating of patient or user in the wheel chair, definitely there is a need to control / manage the wheel chair by second person. To avoid the need of the second person the touch-controlled wheelchair was proposed.
2. Proposed System:
In our system, developing a wheelchair which is operated by touch screen to which inputs given by the person. Wheel chair is smart enough to detect any obstacle coming in front and can avoid it. To detect any obstacle, we are using an IR sensor. Whenever any obstacle is detected by the sensor, it sends signal to at mega microcontroller and the controller will control the movement of DC motor making it stop. The controlled wheel chair in is the present prototype has keys as the input mode. Also, the wheelchair can be controlled by the user himself by pressing the input mode. The wheel chair can be GSM based , where the patient sitting on the wheel chair can have access to additional

features. If the patient on the wheelchair feels uncomfortable or will have some issue regarding health, he/she can send message to his/her relatives or friends indicating the need for help.
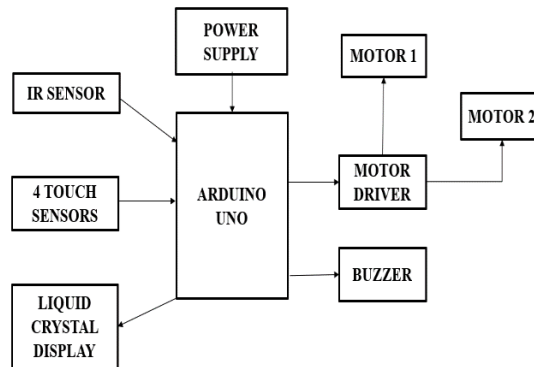
Block Diagram:

Fig: Block diagram of proposed system

3. Components:
Arduino UNO:
The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino UNO. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits.

L293D Motor Driver:
L293D motor driver is mounted on a good quality, single sided non-PTH PCB. The pins of L293D motor driver IC are connected to connectors for easy access to the driver IC's pin functions. The L293D is a Dual Full Bridge driver that can drive up to1Amp per bridge with supply voltage up to 24V. It can drive two DC motors.

DC Motor:
A DC motor is any of a class of electrical machines that converts direct current electrical power into mechanical power. Nearly all types of DC motors have some internal mechanism to periodically change the direction of current flow in part of the motor.

Touch Sensor:
The Touch sensor is sensitive to touch, pressure as well as force. The Touch Sensor works similar to that of a simple switch. When there is contact or a touch on the surface of the Touch Sensor. It acts like a closed switch and allows the current to flow through it. When the contact is released, it acts similar to the opened switch and hence there is no flow of current.

Buzzer:
A buzzer is an audio signaling device, A buzzer is a small yet efficient component to add sound features to our system. It is very small and compact 2-pin structure. This is a simple buzzer which when powered will make a continuous Beep. sound.

IR Sensor:
An IR (Infrared) sensor is a device that detects infrared radiation and converts it into an electrical signal, which can then be processed by an electronic circuit. The operating principle of IR sensors is based on the absorption or reflection of infrared radiation by a material, and the resulting change in the intensity of the radiation received by the sensor.

Transformer:
A step-down transformer is an electrical device that reduces the voltage of an AC electrical power supply. It is used to provide a lower voltage output from a higher voltage input, for applications such as converting 220V AC to 110V AC for use in a 110V electrical system.

Liquid Crystal Display:
LCD is a type of flat panel display used in electronic devices. It works by using a layer of liquid crystals that are lit by a backlight to produce an image. An LCD works by blocking or allowing light to pass through tiny liquid crystal cells that are sandwiched between two transparent electrodes and two polarizing filters.

Arduino IDE:
Arduino IDE is an open-source software, designed by Arduino.cc and mainly used for writing, compiling & uploading code to almost all Arduino Modules.
It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.
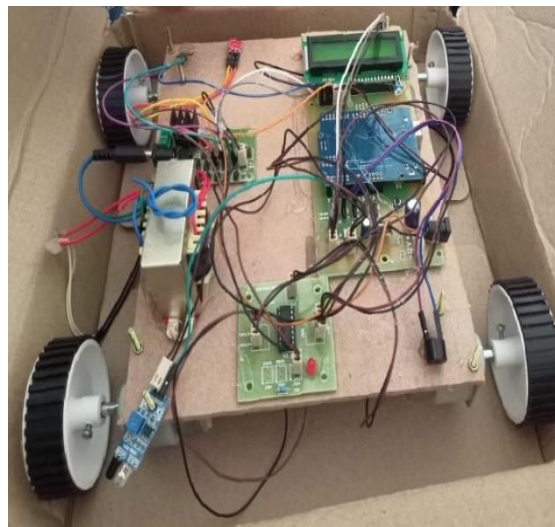
4. Result:

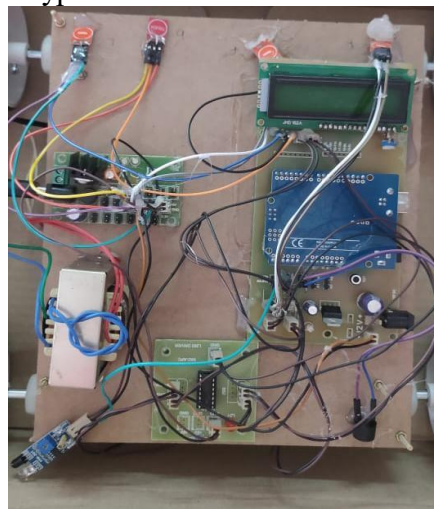Fig: Prototype version of Touch controlled wheel chair

Fig: Present Prototype

5. Conclusion:
We are concluding the paper that The designed touch sensors-controlled wheel chair enables the movement of wheel chair in any desired direction like forward, backward, left, right with the help of

a touch sensor. This touch sensor-controlled wheel chair decreases the dependency on the family members and the care-takers.

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