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Touchpad Control of Solar Powered Wheel Chair

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Abstract: ***In Mobility of the physically disabled or crippled people is a great concern of the society One of the best inventions in the medical field that helped both the elderly and the handicapped is the mobility vehicle. This project aims to design a Touch pad controlled motorized wheelchair that enable a disabled person to move around independently. This paper proposes a new design of solar powered wheelchair implementing an RF module where a transmitter sends the signals to the receiver section which is placed under the wheelchair according to these signals the motors are running which controls the wheel chair directions.***
Keywords: Wheelchair, Mobility vehicle, Touch pad, RF module

I. INTRODUCTION

Embedded systems are also being used in the medical field [1]. An aged or physically disabled person come across many problems while moving from one place So this study develop their lifestyle and also to reduce these difficulties of handicapped and old people with the minimum cost.

Touch screen technology is the direct manipulation type, gesture based technology [2]. A touch screen is capable of detecting and effectively locating a touch over its display area. It is sensitive to the touch of a human finger or stylus. A switch which is manually operated is placed on the chair. Considering the two states of a switch, for state one, the input is given to the touch screen just by applying a small pressure on a particular portion of it. The output from it is analog in nature which is given as input to ADC pins of the microcontroller. Microcontroller process and compares the obtained digital values with the predefined range values. Accordingly microcontroller sends instructions to direct the movement of the chair

II. LITERATURE SURVEY

A wheelchair is a chair with wheels. The device comes in variations allowing either manual propulsion by the seated occupant turning the rear wheels by hand, or electric

Some patients which cannot manipulate the wheelchair with their arms due to a lack of force face major problems such as orientation, mobility, safety [5] .There are various kinds of wheelchair which are being manufactured such as

Manual or self propelled wheelchair-It is normal chair arrangement having wheels which are present on both sides of chair which are dragged by patients manually and Joy-stick operated wheelchair in which joystick is used for operatSpeech Recognition-It recognizes the verbal command given by patient and according to that wheelchair moves. Image acquisition-It uses camera to detect hand movement and according to it movement occurs.

ontrolled- In this sensors like accelerometer sensor and flex sensor. As a stability point of view it is quite good but it reuire high accuracy while designing and programming

The user typically controls speed and direction by operating a joystick on a controller. Many other input devices can be used if the user lacks coordination or the use of the hands or fingers .If a joystick control isn't appropriate for the user's needs, there are other methods [4] of operating the power chair, including a head controller, a sip and puff tube, fingertip control or foot control for those with C2-3 spinal cord lesions or head injuries (the user blows into a tube located near the mouth, which controls the movement of the chair).

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 which requires less force for operation i.e. single finger is enough to operate a wheelchair. As touch screen technology [3] is acquiring highest peek in various scientific as well as commercially developing products, its use in patient friendly devices like wheelchairs may result in improved quality of service.

The wheelchair users are also facilitated with wireless communication for emergency situation. The Intelligent wheelchair is developed as a very low cost product. It is designed as an embedded system and is directly usable; it does not require a laptop or other heavy devices as compared to the sophisticated wheelchair products available today. Hence it proves to be ideal solution for physically disabled and elderly people.

III. PROPOSED ELECTRIC WHEEL CHAIR

A. Transmitting Unit

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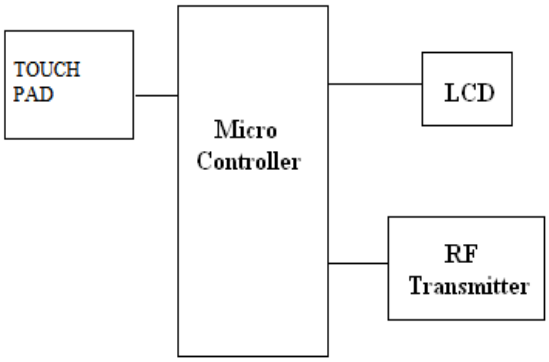


Fig: 1 Block diagram of transmitter unit

The input from the touch screen is given to microcontroller, which transmits the input data serially using RF technology this is an ideal for remote control applications where low cost and longer rang
e is required. The transmitter operates from a 1.5-12V supply, making it ideal for battery-powered applications. The transmitter employs a SAW-stabilized oscillator, ensuring accurate frequency control for best range performance. The input function from touch screen is used to control the directions of the motors fixed to the chair.
On Off Keying is the modulation method of choice for remote control applications where power consumption and cost are the primary factors. Because OOK transmitters draw no power when they transmit a 0, they exhibit significantly better power consumption than FSK transmitters

B. Receiving Unit

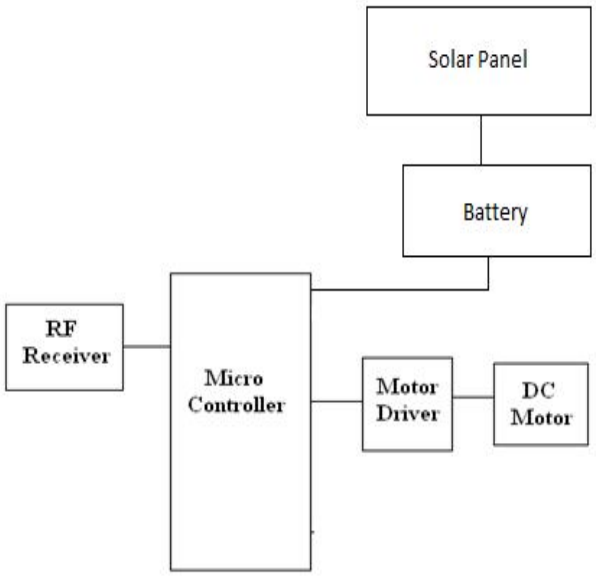


Fig: 2 Block diagram of receiver unit

The STR-433 is ideal for short-range remote control applications where cost is a primary concern. The transmitter operates from a1.5-12V supply, making it ideal for battery-powered applications.
The receiver module requires no external RF components except for the antenna. The super-regenerative design exhibits exceptional sensitivity at a very low cost.. The size and simplicity of these units make them a professional and economical solution for many .

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IV. IMPLEMENTATION OF PROPOSED SYTSEM

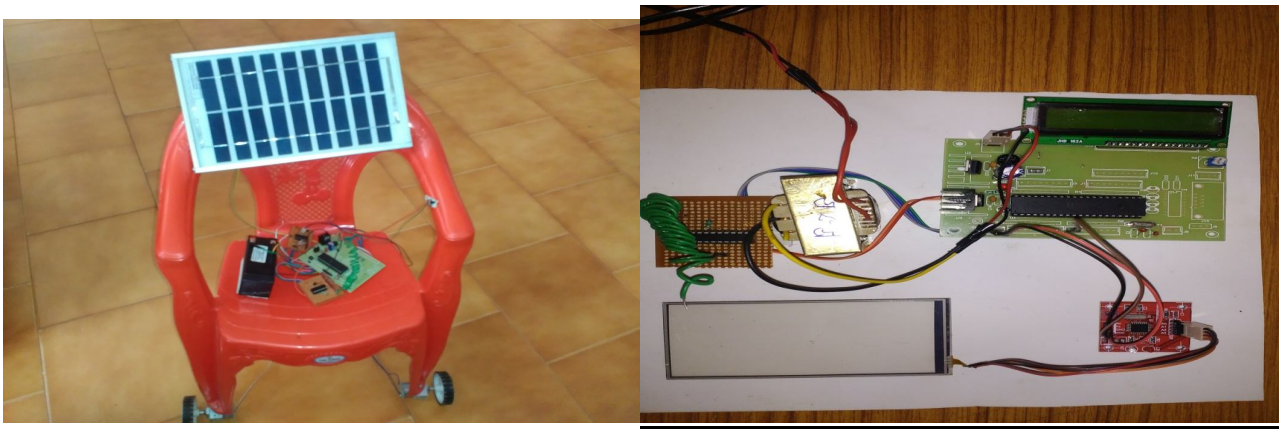


Fig: 3 Hardware setups for touch screen based wheel chair

Initially 3.5" resistive touch screen is interfaced to microcontroller. If switch connected at transmitting unit is equal to one, the microcontroller controls the movement of the chair in forward, backward, right or left depending on the input given to touch screen.
STT-43 and STR-433 is used for transmitting data to receiver section. The every function performed by the system is displayed on the 16x2 LCD.

A. Interfaces for system

The main components of the system contain hardware, software as well as interfacing devices. The touch-screen is used as input device while LCD is used for display. C language is used for designing the software.. 4 wire touch screen is used as touch screen interface. The use of resistive touch screen enables low power consumption

B. Operation for the Proposed System

Touchpad screen is connected to this RF transmitter, we do the required operation on the touchpad which is send to the microcontroller ,this microcontroller sends the information to the RF receiver with the help of RF transmitter ,we use the crystal oscillator to speed up the total operation. This RF receiver has the same components as the RF transmitter. The RF receiver is connected to the battery for DC supply. The motors we are using require 12V/600mA but the power in the RF receiver is 5V/50mA so we use the L293D motor driver in between the RF receiver and the DC motors to convert the power from 5V/50mA to 12V/600mA.The L293D motor driver used to change the directions ,the 1 0 code is used for forward direction and the 0 1 code is used for backward direction.. Here we are using solar panel connected to the battery as an alternative source.

ACTION	FRONT MOTRS	REAR MOTORS
FORWOR	10	01
REVERSE	01	10
RIGHT	10	10
LEFT	01	01
STOP	00	00

Table 1: Measured logics for each corresponding direction of each motor individually.

V. CONCLUSION

The attempt made in fabricating a Solar Powered Wheel Chair with the available indigenous material is successful. The project carried out here will make an impressing task in hospitals and homes. Touch screen based control system is successfully implemented to move the wheelchair left, right, forward, backward or stay in same position.

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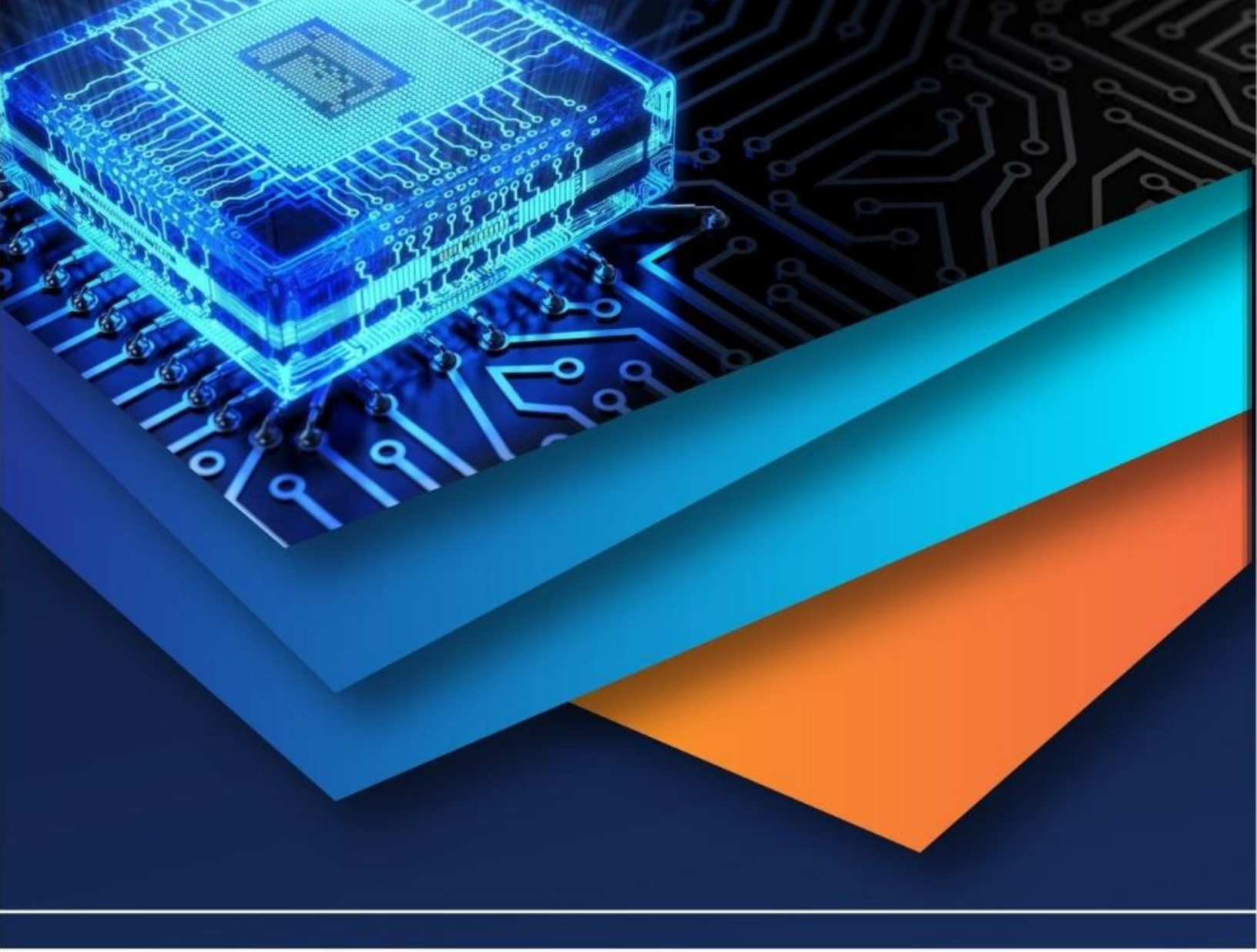
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