HAND GESTURES CONTROLLED WHEEL CHAIR

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Abstract: In today's world, physically handicapped person & elder peoples are depending on others peoples. But today's world becomes fast, everyone is very busy & there are few peoples to take care of these peoples properly. They find the automated wheelchairs for an easy transportation for these physical disable persons. The proposed work is to fabricate a hand gesture based wheelchair using Gesture Control System. Wheelchairs are used by which person who cannot walk due to physiological, injury or any disability.

This project is to develop a wheel chair control which is useful to the physically disabled person with his hand movement or his hand gesture recognition using MEMS technology. The use of powered wheel chair with high navigational intelligence is one of the great steps towards the integration of severely physically disabled people. Driving wheel chair in domestic environments is a difficult task for people with arm or hands impairments .The wheel chair is developed to overcome the above problem described above allowing the end users to just perform safe movements and accomplish some daily life important tasks.

Key words: Hand gestured wheel chair, MEMS controller.

1. Introduction:

The aim of this project is to controlling a wheel chair by using MEMS ACCELEROMETER SENSOR (Micro Electro-Mechanical Systems*)* technology MEMS ACCELEROMETER SENSOR is a Micro Electro Mechanical Sensor which is a highly sensitive sensor and capable of detecting the tilt. This sensor finds the tilt and makes use of the accelerometer to change the direction of the wheel chair depending on tilt [1].

Automation is the most frequently spelled term in the field of electronics. The hunger for automation brought many revolutions in the existing technologies. One among the technologies, which had greater developments, is the MEMS ACCELEROMETER SENSOR. These had greater importance than any other technologies due its user-friendly nature. MEMS

ACCELEROMETER SENSOR based devices can be easily reachable to the common man due to its simpler operation, and at the same time it challenges the designers of the device [2].

This device is portable and this system operation is entirely driven by wireless technology. User can wear it to his wrist like a watch and can operate it by tilting the MEMS ACCELEROMETER SENSOR Accelerometer sensor. This project makes use of a micro controller, which is programmed, with the help of embedded C instructions. This microcontroller is capable of communicating with transmitter and receiver modules. The MEMS ACCELEROMETER SENSOR based sensor detects the tilt and provides the information to the microcontroller (on board computer) and the controller judges whether the instruction is right movement or left movement instruction and controls the direction respectively. The controller is interfaced with two dc motors to control the direction of the wheel chair**.**

2. Overview:

Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result.

The project MEMS accelerometer sensor controlled wheel based on RF and also by using 16F877A Microcontroller is an exclusive project that can move the wheel chair according to the instructions given by the above said microcontroller.

3. Hardware Description:

3.1. The main blocks of this project are:

- Micro controller (16F72, 16F877A)

- . Reset button

- Crystal oscillator

- Regulated power supply (RPS)

- Led indicator

- MEMS accelerometer sensor module

- RF transmitter and receiver

- DC Motors

- DC motors drivers

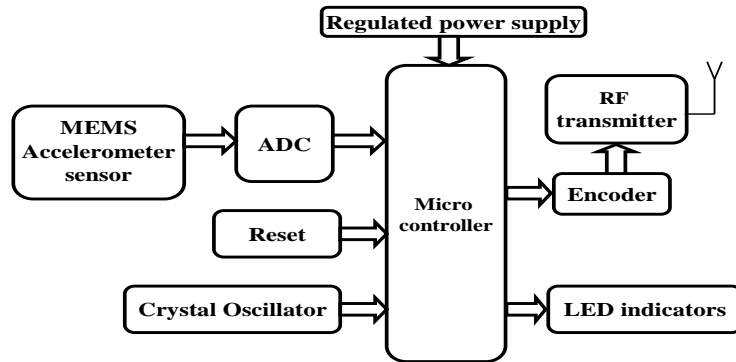## Head gestures controlled intelligent wheel chair
1.Transmitter

FIG 3.1: Block diagram of Wireless Gestures controlled Wheel chair

Head gestures controlled intelligent wheel chair
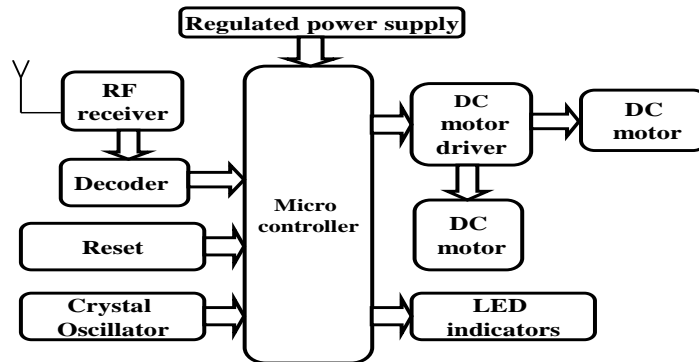## 2. Receiver

FIG 3.2: Block diagram of Wireless Gestures controlled Wheel chair
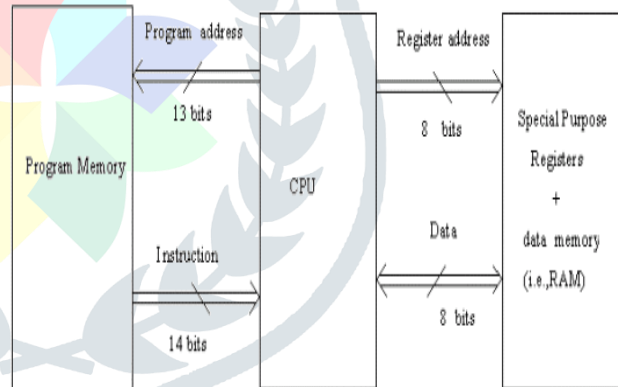

Fig: 3.3 Microcontrollers

3.2. CPU Architecture of plc micro controller:

The CPU uses Harvard architecture with separate Program and Variable (data) memory interface. This facilitates instruction fetch and the operation on data/accessing of variables simultaneously. Architecture of PIC microcontroller. Basically, all PIC microcontrollers offer the following features:

- RISC instruction set with around 35 instructions _9 Digital I/O ports
- On-chip timer with 8-bit prescaler.
- Power-on reset
- Power saving SLEEP mode
- Direct, indirect, and relative addressing modes
- External clock interface
- RAM data memory
- EPROM (or OTP) program memory

Fig.3.4. DC Motor Used   **Fig.3.5.Architecture of PIC microcontroller**

3.3. DC motor used:

Here we are using permanent magnetic DC motor. Actual RPM of this DC motor is 2400 RPM. We are using spur gear box to reduce   2400RPM to 60RPM.
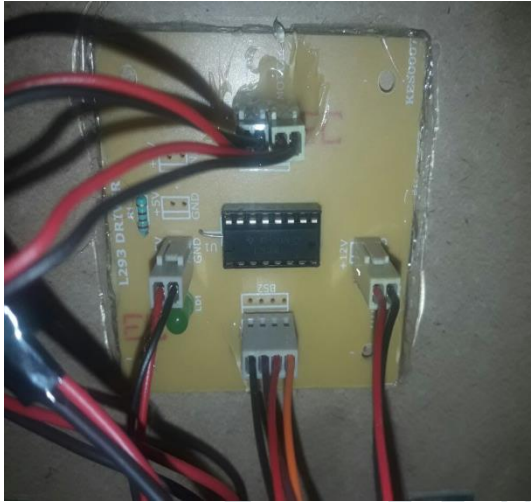
4. Fabrication:

Fig.4.1. L293 driver and circuit used

Fig.4.2. Mother Board Used

5. Result:

The project "**Wireless Gestures controlled Wheel chair**" was designed such that the wheel chair can be operated using MEMS accelerometer sensor wirelessly using RF technology.

6. Conclusion:

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

This paper is implemented using various components, the project is just a proto type if we make this project as commercial project, then definitely useful to all the disabled people, who are unable to move and unable to drive normal wheel chair their own. With their hand movements they can move wheel chair right, left, front, and back directions.

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