Human Follower Robot using Arduino
Overview

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Introduction

• Advantages of Robotics – High performance, high accuracy, low labour cost, ability to work in hazardous situations

• Human follower robot in industrial automation
Block Diagram

- Ultrasonic Sensor
- Arduino Microcontroller
- Motor Driver
- DC Motor 1
- DC Motor 2
Hardware requirements

• Microcontroller board – Arduino Uno

• Ultrasonic Sensor – HCSR04

• Motor driver IC

• DC Motor

• Power Supply
Arduino Uno Features

- ATmega328P microcontroller
- Input voltage - 7-12V
- 14 Digital I/O Pins (6 PWM outputs)
- 6 Analog Inputs
- 32k Flash Memory
- 16Mhz Clock Speed
ATmega328P

- 8-bit microcontroller
- 8KB ROM
- 256 bytes RAM
- 3 timers
- 32 I/O pins
- 1 serial port
- 8 interrupt sources
Ultrasonic Sensor HCSR04

- Ultrasonic sensor has a transmitter and receiver
- Frequency is 44KHz
- Speed of Sound waves is 340m/s
- Distance can be calculated as Speed x Time / 2
Motor Driver IC

- This Motor Driver Board is designed to Work with L293D IC.

- This can control 2 DC Motors, their direction using control lines and their speed using PWM.
DC Motor

- Converts direct current electrical power into mechanical power

- The very basic construction of a dc motor contains a current carrying armature which is connected to the supply end through commutator segments and brushes are placed within the north south poles of a permanent or an electro-magnet
DC Motor - Construction
Power Supply

230 V AC
50 Hz

12V step down transformer

Bridge rectifier

Filter (470 μF)

5V Regulator

5V DC

Transformer 12-0V

Bridge Rectifier (+12V)

Voltage Regulator

R40 330 Ω

C11 10 μF

D41 LED-RED

GND
Software requirements

• Tool
  Arduino IDE

• Programming languages used
  Embedded C/C++
Advantages

• Code compatibility and expandability across different Arduino boards

• Cost is less as Arduino is open source

• The schematic of Arduino is open source. So for future enhancement of the project the board can be extended to add more hardware features

• Ultrasonic sensor has large range and can be used in any lighting conditions
Future Work

• Hardware can be enhanced

• This will allow the use of advanced sensors like Kinect sensors

• Image processing algorithms can be added
Conclusion

- Designed human follower robot using Arduino microcontroller
- It can follow a human whenever he moves in a straight line
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