Project Proposal

Hand Gesture Controlled RC Car

Group members

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GOAL

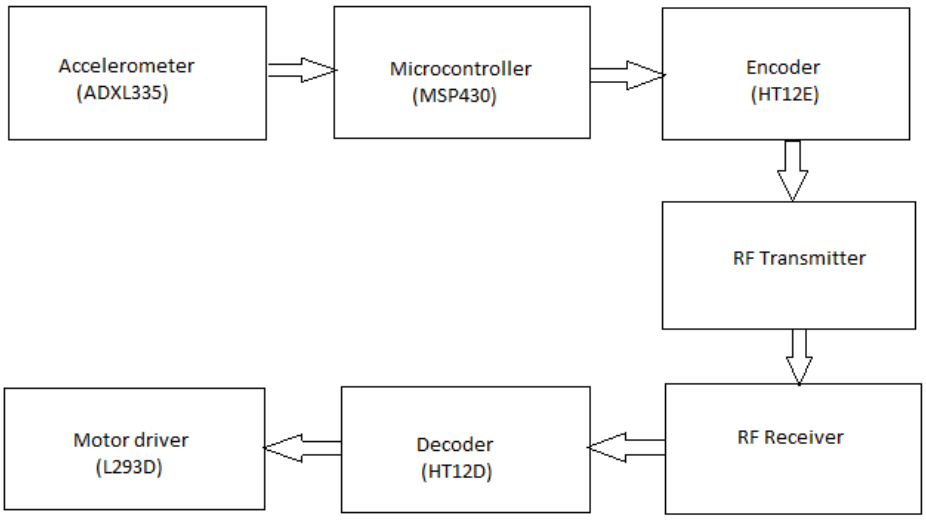
The Goal of the project is to develop a gesture controlled device that can recognize commands through hand gesture and provide desirable result in the environment. For demonstration purposes, we are going to develop a Gesture Controlled RC Car using MSP430.

Hardware Components:

1. ADXL335 Accelerometer: The ADXL335 is a triple axis MEMS accelerometer with extremely low noise and power consumption - only 320uA! The sensor has a full sensing range of +/-3g. There is no on-board regulation, provided power should be between 1.8 and 3.6VDC.
2. MSP430 Launchpad (MSP-EXP430FR6989): Ultra low power, 128 kb FRAM, I/O and an LCD Controller.
3. RF transmitter receiver module: Operating frequency - 434mhz and 500Ft range (given perfect conditions)
4. HT12E Encoder IC: HT12E is an encoder integrated circuit of 212 series of encoders. They are paired with 212 series of decoders for use in remote control system applications. It is mainly used in interfacing RF and infrared circuits.
5. HT12D Decoder IC: HT12D is a 212-series decoder IC (Integrated Circuit) for remote control applications manufactured by Holtek. It is commonly used for radio frequency (RF) wireless applications.
6. L293D Motor Driver IC: L293D is designed to provide bidirectional drive currents of up to 600 Ma at voltages from 4.5V to 36V. L293D devices are quadruple high current half-H drivers.
7. Geared Motor: Operating voltage of motor is 9 to 12 V.
8. 7805 Voltage regulator: This is the basic L7805 voltage regulator, a three-terminal positive regulator with a 5V fixed output voltage. This fixed regulator provides a local regulation, internal current limiting, thermal shut-down control, and safe area protection for your project. Each one of these voltage regulators can output a max current of 1.5A.

Implementation:

BLOCK DIAGRAM OF GESTURE CONTROLLED RC CAR



The Accelerometer recognizes the hand gesture based on the tilt angle and gives an output to the msp430 controller. Based on the output from the accelerometer the controller gives out commands that are encoded and transmitted using a RF transmitter. Once the receiver gets the data it is decoded and sent to the motor driver. Based on the input received the motor driver gives output to the motor thereby controlling the direction of the car.

INTERFACING:

The accelerometer detects the hand movement which is an analog signal. Accelerometer used here is a 3-Axis, namely X, Y, Z. The analog input is given to the MSP-430 which has an inbuilt ADC (Analog to digital converter). The converted digital signal is given to the encoder. Here we need to use a 3-bit encoder so that it caters to the 3-axis input from the MSP-430. The encoded output is given as the input to the transmitter which wirelessly transmits the data to the receiver. The receiver generates an output and provides as an input to the decoder whose

output acts as an input to the motor Driver that drives the motor which in turn controls the direction of the car.

REFERENCE:

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