COEN 6711

Microprocessors and Their Applications

Project Team

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Project Title: **Automatic Braking System**

Project Repository: https://github.com/gsanthar/Automatic-Braking-System

Project Goal:

The purpose of this project is to design and implement Automatic Braking system based on ARM Cortex – M0+ microcontroller to detect obstacle for automotive vehicles and prevent it from colliding against the obstacle by braking the system and disabling the acceleration.

Requirements:

Hardware Requirements:

- Freedom board - FRDM-KL25Z
- Ultrasonic Sensor - HC-SR04
- Motor Driver - L293DNE
- Robot Car Chassis kit

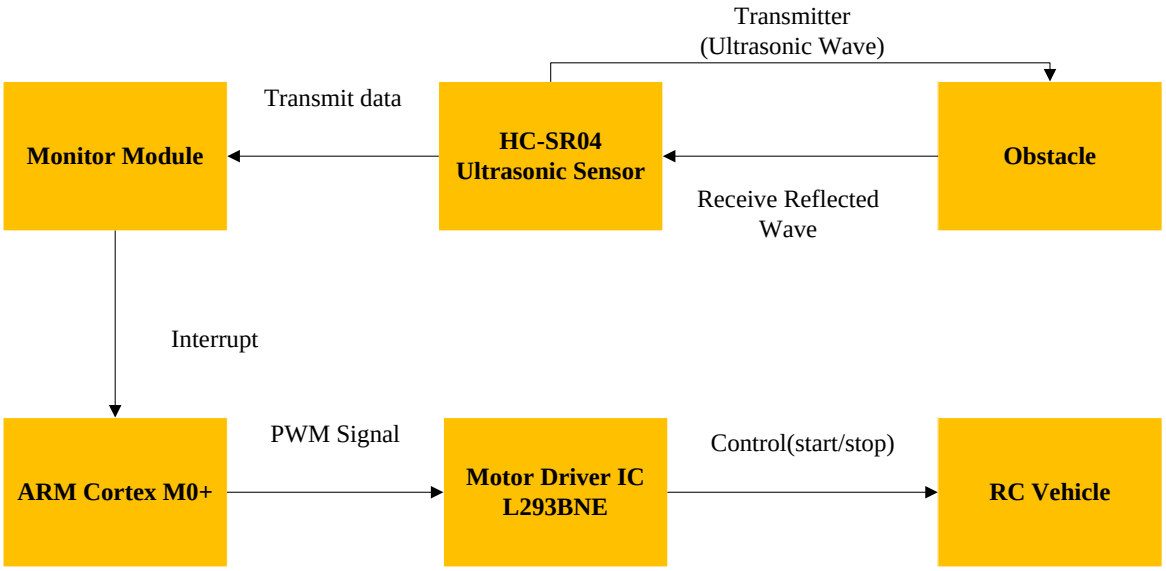
Software Requirements:

- GCC Cross Compiler Tools for ARM

Functional Specification:

This Project utilizes Ultrasonic Sensor to detect the distance of obstacles from vehicle and based on the input from sensor, the firmware of FRDM-KL25Z brakes the vehicle if the obstacle is too close to the vehicle. It also contains a Motor driver which is integrated to of FRDM-KL25Z to drive the vehicle. The Sensor will be mounted on the vehicle and the signals are transmitted constantly from it and the reflected signals are received back from the obstacles if any. A Decoder module in the firmware converts the received signals into relative distance between the obstacle and vehicle. A safety Module monitors the calculated distance and if the distance measured crosses above defined safety limit, it interrupts FRDM-KL25Z firmware to stop motor driving function and disable acceleration.

Functional Diagram:



Deliverables: