# EEE212 Term Project Proposal

# Hand Gesture Controlled VR Remote Car

### Introduction

In this project, the aim is to design a hand gesture controlled remote car with a VR cam installed on top. The gesture control will be done by a gyroscope and an accelerometer, installed on a glove alongside with an Arduino Uno to handle the communication between the user and the car. The communication will be done via Bluetooth connection and to receive the signal and control the motors and the car, FRDM-KL25Z board will be used. All the code will be in embedded-C language. A small action cam will be mounted on top of the car and the video feed will be streamed to smartphone connected to VR glasses, so the user will be fully emerged to the experience.

### Design Specification Plan

First, we will use 4WD robot car chassis and 4 servo motors with wheels. On the chassis, there will be FRDM-KL25Z, a motor driver, battery, Bluetooth receiver. All of these sensors will work together to control the motion of the vehicle, according to the gesture input coming from user's hand gestures. For the hand glove part, an Arduino, gyroscope/accelerometer and another transmitter Bluetooth module will be used to create the signal to control the car. Two Bluetooth modules will be paired in Master-Slave configuration.

For gesturing, if the users hold their hand level, there will not be a signal present, so the car will not move. Tilting the hand forward will mean acceleration for the car which will make the car move forward. Conversely, tilting the hand backward will mean rear acceleration, which will make the car move backward. If the users tilt their hand clockwise, only the left 2 wheels will work so the car will steer to right, and vice versa for the counter clockwise motion.

Finally, an action cam will be installed on the car and the video feed will be streamed over its own wireless network, with its own smartphone application.

## Proposed Design Methodology

The sensors and modules will be all programmed with Embedded-C Language, on the FRDM-KL25Z and Arduino Uno.

Required peripherals are as follows:

- FRDM-KL25Z Board
- Arduino Uno
- 2 * HC-05 Bluetooth Modules
- MPU6050 Gyroscope/Accelerometer
- 4 * SG90 Servo Motors with Wheels
- L298N Dual DC Motor Driver
- Battery
- Jumpers
- LEDs
- Glove
- Action Cam
- VR Glasses
- 4WD Car Chassis