Complex Engineering Activity

Gesture Controlled Car

Course Code and Title: EE-273L Microprocessor Systems

Semester: Fall 2023

Instructor: Miss Shehzeen Malik

Total Marks: 30

Deadline: Last week of semester

CLOs and PLOs for Complex Engineering Problem

CLOs		Description	Domains	PLOs, Levels
CLO3	Lab	Design and implement a project to master programming skills.	Psychomotor	PLO03 5. Naturalization
CLO4	Lab	Demonstrate teamwork and project management.	Affective	PLO11 4. Organization

Problem Statement

In this complex engineering problem, students are required to design and implement a gesture-controlled car. The car will be guided along a maze by the student using inertial measurement unit sensor, attached to the user's hand. Gestures of the hand will be translated to position coordinates by the controller which will transmit direction commands to the robot over WiFi. Tiva-C Launchpad (Cortex M-4 TM4C123GH6PM) will be used to perform and implement algorithms for this purpose. The car is driven by DC motors to control the movement of the wheels. ESP32-WROOM-32 series board will control the speed of the motors, steering the robot to travel along the maze smoothly.

Objectives

The purpose of this Complex Engineering problem is to analyze, specify, design, implement, document, and demonstrate a complete embedded system.

Deliverables

1. A complete working project.

2. A comprehensive report including block diagram of the hardware assembly, brief discussion about working of the project and tasks performed by each group member.

3. There will be a departmental level competition of gesture controlled robots in the last week of the semester along with viva. All groups will compete against each-other. Grading will be done based on working of the project (response time, code optimization, and its implementation).

Attributes of Complex Engineering Activity

- EA1: Range of resources – Methodically investigates different design approaches and techniques to design an embedded system. The design involves internet resources, information related to software usage and technology. .

- EA3: Innovation – Select an optimal methodology to design the firmware of the system. Addressing sustainability and optimization of the design based on engineering principles and knowledge.

Rubrics	CLOs	Marks
Taken care of voltage and current ratings, correct hardware connections and clean wiring	EA1	CLO3	5
Complete understanding of the working code	EA1, EA3	CLO3	20
Display of collective effort to achieve a working project	EA1	CLO4	5