INF2004 Embedded Systems Programming

T15: Project Proposal

Name	Student ID	Work Package Distributions
Abdul Halim Bin Abdul Rahim	2201627	Task 1
Rayson Yong Ching Rong	2201099	Task 2
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TASK 1 (HALIM): Robot Car Construction and PID Controller

Objective: Assemble and construct the two-wheel robot car, ensuring mechanical stability and precise wheel control. Design/implement a PID controller for precise car movement.

Tasks:
1. Assemble the chassis, wheels, and motors according to the design specifications.
2. Design and implement the PID controller for speed and steering control.
3. Test and calibrate the mechanical components to ensure smooth movement and stability.

TASK 2 (RAYSON): Distance measurements - Ultrasonic Sensor Implementation

Objective: Implement ultrasonic sensors into the robot car for obstacle detection.

Tasks:
1. Research and select appropriate ultrasonic sensors for obstacle detection.
2. Implement ultrasonic sensors into the car's design and connect them to the Raspberry Pi Pico.

TASK 3 (JING YI): Navigations and Mappings - Algorithm Optimisation

Objective: Implement navigation algorithms that guide the robot car along the track, avoiding obstacles and optimising for efficiency.

Tasks:
1. Research and select navigation algorithms suitable for the project's requirements.
2. Develop and implement algorithms for path planning and obstacle avoidance.
3. Test the navigation algorithms using a simulated environment before deploying on the robot.

TASK 4 (KANG LE): Barcode Recognitions - Infra-red Sensor Implementation

Objective: Develop algorithms for barcode detection using infrared sensors.

Tasks:
1. Develop barcode recognition algorithms capable of reading "Code 39" barcodes.
2. Implement a barcode recognition system with the robot's control software.
3. Implement infrared sensors for line following and barcode recognition.

TASK 5 (IBRAHIMARASHID): Overall Testings and Integrations, User Interface and Documentation

Objective: Create a user interface for controlling the robot, documenting the project's design, and conducting comprehensive testing.

Tasks:
1. Design and develop a simple user interface for users to interact with the robot.
2. Document the project's design, including hardware components, software architecture and algorithms.
3. Conduct thorough testing to validate the robot's functionality and performance.
4. Prepare a comprehensive project report and presentation for project assessment.