ISDN 2602 Internet of Things: Integrative System Design

Final Project: IoT-empowered Robotic Car Tracking over Mini-UST Arena

Early Demo: Friday, May 10th, 16:00-18:00 @ ISDWorks!

Regular Demo: Friday, May 16th, 14:00-17:20 @ ISDWorks!

1. Introduction

In the final project, each student team will write their own program to drive an unmanned robotic car. The target is to move the car on a given Mini-UST Arena, by tracking the HF RFID tag lines and following the traffic light. There are several
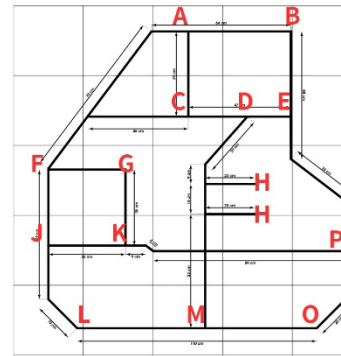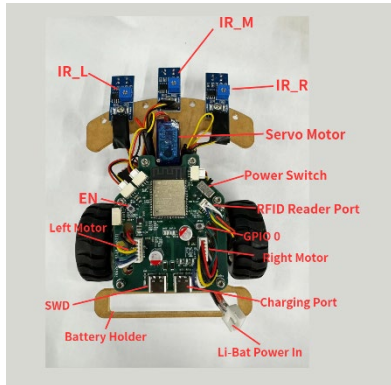
tasks/challenges.
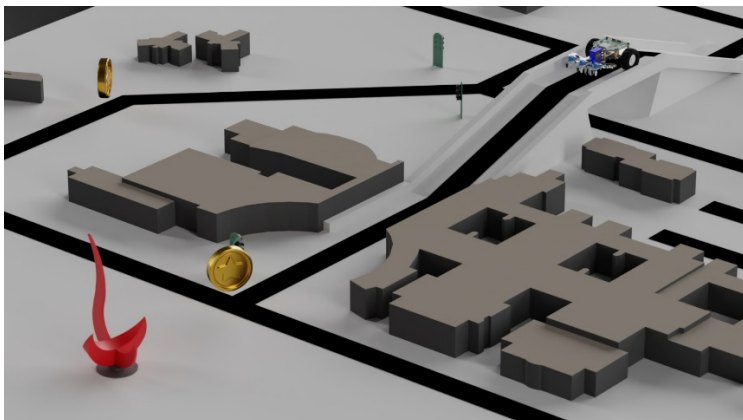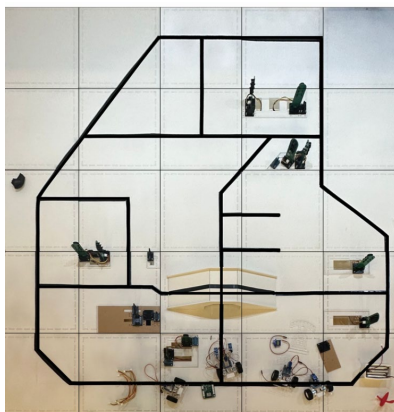
No additional hardware modifications are allowed. Faulty modules can be replaced after being approved by the teaching team.

2. Tasks and Evaluation Criteria (25% for the project)

There are four tasks as shown below.

No.	Objectives	Trail/Time Limites	Percentage	Marking Scheme
1	Finish the route with the fixed **start and end points**. The traffic lights are **off**.	2 Trails within **2 minutes**	**5%**	**2%** for finishing the routing. **1%** for picking the shortest path. **2%** for finishing the route within 60 seconds (1% for finishing within 90 seconds).
2	Finish the route with the given **start and end points** The **traffic lights** are **ON**.	2 Trails within **2 minutes**	**5%**	**2%** for finishing the routing. **1%** picking the shortest path. **2%** for finishing the route within 60 seconds (1% for finishing within 90 seconds).+20 seconds if the car rushes the **RED** light.
3	With a **randomly given start point and a given end point,** finish the route with the **traffic lights ON**.	3 Trails within **3 minutes**	**6%**	**3%** for finishing the routing. **1%** picking the shortest path. **2%** for finishing the route within 90 seconds (**1%** for finishing within 120 seconds).+20 seconds if the car rushes the **RED** light.
4	The start and end points are both **randomly given,** and the **traffic lights** are **ON**.	3 Trails within **3 minutes**	**6%**	**3%** for finishing the routing. **1%** picking the shortest path. **2%** for finishing the route within 90 seconds (**1%** for finishing within 120 seconds).+20 seconds if the car rushes the **RED** light.
5	**Code Submission** to GitHub Repository.	By May 16, 2024	**3%**	The quality of the code will be graded for code efficiency and logic clarity.

3. Remarks

1. **Extra trials** will be given to groups who choose to do early demo on May 10.
2. Random routes are pre-generated with **similar difficulty level**.
3. Time starts when your car starts running.
4. For cars running out of the track, please move the **car back to the start point** to restart the journey in this task.
5. You can restart the car multiple times as long as the **time limit** for the task is not reached.
6. 20 seconds penalty will be given, if the car rushes the RED light. But, this only applies to your final/successful run.
7. Successful completion time = "finish time" – "start time"+"penalty from the successful run".