

Team DragonBot

Conceptual Design Review

DragonBot Project

The DragonBot is designed to be a mobile robot that can follow the line and detect obstacles. It is designed to be a mobile robot that can follow the line and detect obstacles. It is designed to be a mobile robot that can follow the line and detect obstacles.

Card Reader Design Engineer (Matthew Hillsman)

The objective of the Card Reader Design Engineer is to design and implement the system for the robot to read the cards. The system will be designed to read the cards and store the data in the database. The system will be designed to read the cards and store the data in the database.

Navigation Design Engineer (Maath AlMandhari)

The navigation design engineer is responsible for designing the hardware and the software required to make the robot to detect its position, collect information about its surroundings, and navigate its path using the map.

Control Design Engineer (Amha Abera)

The control design engineer is responsible to develop and implement solution to keep the DragonBot balanced in two wheels while it navigates through the track. The engineer is also responsible for designing and testing hardware and software to keep the robot balanced without the frame touching the ground.

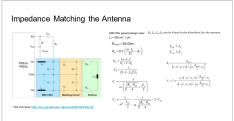
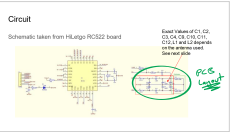
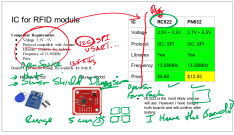
Game Software Engineer (Charles)

The purpose of the game software engineer is to develop an algorithm that would control the robot during the matching phase. This is responsible for moving from the start location to an object that must be collected. Specific objectives defined in the game's manual during the matching phase after the matching and calibration phase. Implement the information to find a optimal path solution.

Card Reader Design Engineer

How does RFID work?

The Radio Frequency module generates a high frequency electromagnetic field. When the antenna of the module passes within close proximity of the of an RFID tag, the EMF covers up the passive component which then responds with an identification number and data that has been written to the device.



Antenna Choices

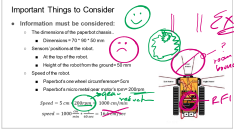
Part	1000	1000
Frequency	1000	1000
Power	1000	1000
Material	1000	1000
Exposed Copper	1000	1000



Navigation Design Engineer

Navigation Design Engineer Research

- Objective: The purpose is to detect an obstacle (robot) that navigates through the path by finding the location of a white obstacle under the floor of the track.
- Methodology:
 - Building an obstacle-gated robot.
 - Using LDC sensors to detect obstacles.
- Research:
 - Research: ISESO 2013 (Innovation-gated robot) [1]
 - Robot vision 2010 (Innovation-gated robot using IR sensors) [2]



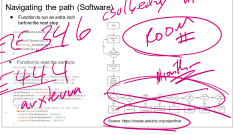
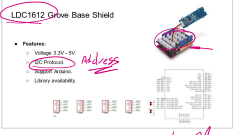
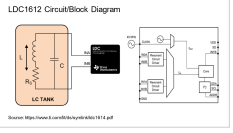
Important Things to Consider

- Information must be considered:
 - Dimensions: 10-15 cm wide
 - Material: metal or plastic
 - As the top of the track
 - Height: the height of the sensor must be 10-15 cm
 - Material: metal or plastic
 - Material: metal or plastic
- LDC sensor requirements:
 - Sensor's orientation
 - Large robot wheel base: 10cm (about half to equal to support's length)
 - Wheels must be equal in their size (but it was the paper's width)
 - Detection time:
 - Faster than the speed of the robot = 10 cm/s
 - High accuracy range:
 - Higher than 50 cm considering the sensor's position
 - Accuracy:
 - From each sensor shield
 - Open source

LDC Comparison

Name	Price	Accuracy	Range	Product	Voltage
LDC1612	1.50	20cm	20cm	TI	3.3V-5.0V
LDC1610	1.50	20cm	20cm	TI	3.3V-5.0V
LDC1614	2.00	20cm	20cm	TI	3.3V-5.0V

LDC1612 is the most cost-effective for the improvements.

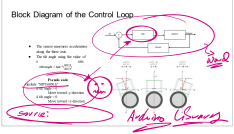


Control Design Engineer

Control Design Engineer Research

Objective: The purpose of the sensor is to detect IR and/or whether the robot is falling forward or backward.

Previous Work: Arduino self-balancing robot



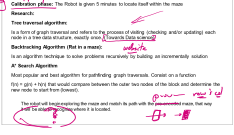
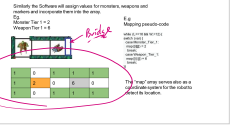
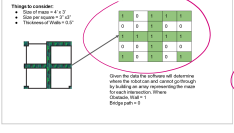
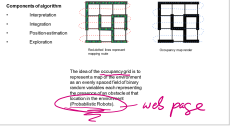
Game Software Engineer

Game Software Engineer research:

Objective: To build a program for the matching phase, calibration phase and execution phase, by using robotic mapping algorithms and integrating sensor information for an optimal solution.

Research: Occupancy Grid Mapping (mapping given sensory information)

Depending on the data received the Software will generate a grid map with specific types which will map objects, walls, and borders.



Object Oriented Programming

OOPs - Arduino

186 C++