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In this project, our initial phase specifications are designing a robot with specific characteristics mentioned in the document provided by the professor, in this we can clearly see that a proximity sensor is needed, gps for location, a significant communication with the server and the environment and a path that is given before the simulation.

There is also a server which will be monitoring the data structure and communicating with the robot and updating the data structure.

Lastly there is a processing method needed for four loops of operation in relation to the clock cycle.

Below is the explanation per program on what has been coded to meet those requirements.

Processing.h

In the processing the update method updates the position of the robot and of the obstacles and if the robot is close to the boundary or obstacle, processing is going to send a signal. In relation to the receive, processing receives data from the robots and the robot takes 2 things and gives processing two things, the signal clock and value.

On the signal clock’s positive edge, we take the value from the robot and when we have new data to transmit, we then send a clock edge and a value on to the robot.

Inside the processing code we have 2 tables and the map. One of those tables is for the receive method to update new data from the server. The second table is for the update method and we just update if the robot is close to the boundary or close to the obstacle and we set a status flag which triggers the transmit method.

Server.h

The server receives information from the robot and updates the status table which contains current grid of robot and next grid and moving status. In the transmit method, when the server updates the table, the server sends the new information to the robot.

Robot.h

The robot relays information between the server and processing and it has the same receive and transmit method for both the server and processing. There are a total of 4 methods, first is receive from server and other one is receiving from processing and then there is one regarding transfer to server and transfer to processing. The receive methods are sensitive to the rising edge of the signal clock from the respective unit and reads the value from the unit. The transmit methods send out a signal clock edge and the data from one unit to the other.

sys\_mon.h

The monitor has methods that check the sent values from each unit when the respective signal clock has a rising edge.

There were errors when compiling and we were not able to run and simulate the system.