Sumo Robot Report

This is the project report for the robot “Interpreter” made for the class MAE 6194

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Contents

Summary

Figure 1: Interpreter

We made the “Interpreter” for the Sumo Robot Competition, which was held as a part of the course MAE 6194. The basic functions and features of the robot are listed below.

- Finds the opponent using sonar sensors
- Detects the line using QTI sensors
- If and opponent is detected, accelerates towards it
- If the opponent is close enough, raise the flipping shield
- Send every task the robot is performing through XBee
- Another Arduino board reads the transmitted data via an XBee, and prints to an LCD display

This report is organized as follows. First, we will discuss the details on the body structure and the sensors. Then we will be explaining how the attacking mechanism works. Next section is on details of the LCD serial monitor system which is used to continuously monitor and debug the robot. Then we will provide an overview of the overall algorithm which is used to control the robot. Finally the issues we faced and the proposed future developments. The codes are attached in the appendix.

Physical Structure

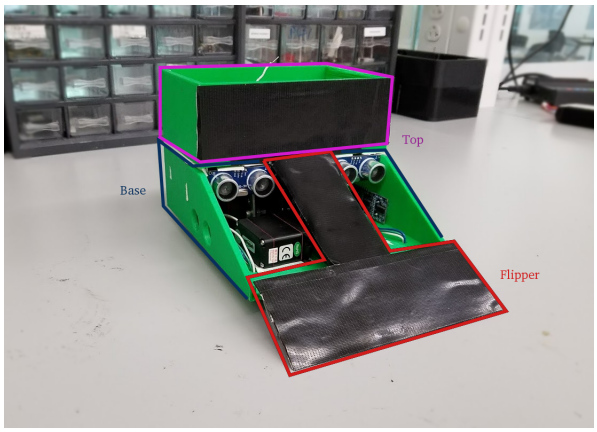

Figure 2: Structure

In this section, we discuss about the body structure of the robot and the sensors. The robots structure mainly has three parts.

1. Base
2. Top
3. Flipper

Base holds all the motors, back and side sonar sensors, and the QTI sensors at the bottom. On top of the Base, we have placed the Top which securely holds the Arduino board, batteries, Xbee unit, and the two front sonar sensors. Flipper is hinged to the front bottom edge of the Top and a servo motor with an arm is placed on the base, directly under the flipper, to activate the attacking mechanism.

Sensors and Components

Line Detection

Attacking Mechanism

Display System

Algorithm

Sumo Bot Code

LCD System Code

List of Components

Future Developments