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ECE 153B Final Project Proposal
Project Website
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Introduction: Soccer Goalie

  This project will be as if you are the goalie in soccer. This project will involve the use of a servo motor that will control the arm that will allow one to block the incoming object. We will use the Ultrasonic Distance sensor to determine the distance at which the object is. In this case it would mimic the role of a soccer ball. When the ball reaches a certain distance away from goal the output on the LCD display will output the word 'block' which will alert the user to send a command via termite to the servo motor in order to activate the arm the would block the ball from entering past the goal line. If the distance at any point becomes lower than a certain threshold, we know that the user failed to block the ball correctly and the score counter which would be on an external LCD display would increase.

Peripherals:

- Servo Motor
- External LCD Display
- Ultrasonic Distance Sensor

Protocols:

- UART
- SPI

Software Design:

  In this project the main objective would be to know when to activate the goalie when the LCD display tells you to. Then using the UART communication protocol, you can communicate with the servo motor in order to activate the control arm that block the "soccer ball" or any other incoming object. The LCD display will display the distance of the incoming object until it reaches a certain distance which will then display the message "BLOCK" telling the user to activate the blocking mechanism. If the user is unable to block the ball then that means that the ball's distance is under some specific distance threshold, and the LCD display that keeps track of the score increased by 1. I will use interrupts with the highest priority to activate the servo motor to start the blocking mechanism.

Goals:

Step 1

  The first step in this project would be to get the ultrasonic distance sensor to work and determine the distance at which I want the threshold to be where the control arm would want to be activated.

Step 2

  Build the housing for the devices as well as develop the connection between the servo motor and the user whether using UART. As well make the score counter to be integrated into the system using SPI

Step 3(Final Step)

  A fully functional goal that would provide goal protection based on user input when advised by the system.

Long-Term Goal

  Allow the system to block the ball at various heights as well since it blocks only when the ball is rolling.