FYP Plan/Strategy

Background:

The objective of this project is to and construct creative interactive displays using Arduino/Raspberry Pi controller, sensors, actuators, LEDs and speaker, with light, sound, animation and wireless communications. In light of COVID-19 there should also be a virtual display done at the end to allow for a non-physical experience of the project.

The background would be to create an interactive display that is able to be showcased for IEM’s open house displays.

Ideation:

Taking inspiration from both Pong and Pinball, the idea is to create a pinball like game where the user plays against a computer-controlled board to attempt to score. One side will be controlled by the user and the other will be by the computer.

Being pinball like, the goal is defended by the use of 2 flippers and those flippers are used to attack as well. There will be static and dynamic obstacles on the board and in the way of the goals. To ensure users are able to score, the opponent will be programmed in such a way that allows it to sometime miss the ball coming towards it.

The brains of the project will be an Arduino board. The Arduino board will have 3 main functions. Keeping score, controlling the robot opponent and controlling the obstacles. Score will be kept by sensors at the end of the board if it detects the ball then it will add one point. Points will be shown by a 7-segment display. The Arduino will be using IR sensors to see if the ball is coming and use them to know when to activate the flippers. How the flippers will be made will have to be tested. 3 possible paths can be taken. Using a servo motor, using a DC motor with limit switches and using solenoids. Testing will need to be done to see which is sufficient. Lastly, there will be 2 kinds of obstacles. Static and dynamic. Static ones are just there but will have sensors to know if the ball has hit them. If it has been hit, it will light up. Dynamic obstacles are those that will move. These will either be moved by DC motors or servo motors. Having these dynamic obstacles will add more uncertainty and unpredictability to the ball making it more interesting.