

Pin Hockey  
ECE 153B Project Proposal  
Cesar Gonzalez, Byron Aguilar, and Hamilton Wu

Overview:

We plan to create a physical game merging the ideas of both air hockey and pinball. There will be an enclosed field; on both ends of the field there would be two flippers that guard your "goal". These flippers will be controlled by simple actuators, which are each triggered by a different button. The actuators will be hooked up to a 12v power supply, independent of the LPC board. Score keeping will be implemented using break beam sensors and a led matrix. Break beam sensors will be placed on both goals waiting for a passing ball to trip the infrared, signifying a point being made, this score will then appear on the led matrix. A tilting mechanism of the entire playing field will be implemented using two servos on opposing sides in the middle of the field enclosure. If the ball happens to get stuck somewhere on the board, this tilting mechanism will be used to roll the ball back into play. Break beam sensors will be used across the board to indicate on whose side the ball got stuck on.

Peripherals:

- 1) 16x32 LED Matrix
- 2) Push Buttons (4) (connected directly to the actuators)
- 3) Servos (2)
- 4) Break Beam Sensors (4)

Goals:

- 1) Build a sturdy and appealing playing field (out of cardboard)
- 2) Functional LED Matrix that displays current score of the game
- 3) Implement break beam sensors
- 4) Implement servo control with the LPC

Software Design:

We plan to first create the necessary helper functions to control all the peripherals we want to use. To do this, we must test and create basic functions for things like servos and the LED matrix. To control the servos, we will use the LPC's motor PWM module to generate the necessary waveforms. Unfortunately, there is little to no sample code for PWM, so this will take a bit of time to figure out. For the LED matrix, we will use SPI to send character data to it. Once this is done, we will create the main code for implementing the game and its rules.

Group Responsibilities:

Cesar will be responsible for purchasing some of the peripherals and writing the code for the LED Matrix. Hamilton will be responsible for purchasing the remaining peripherals and materials as well as working with the break beam sensors. Byron will be working on the servos and making sure the code will work together. Everyone will help build the playing field and help each other with our respective parts.