

Ball-Shooting Game Project Proposal

ECE 153b

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Overview

Our project is to build a real ball-shooting game. One player plays as a goalkeeper and chooses one of the two sides (left, right) to defend the goal. Another player places a ping pong ball on to the shooter machine and uses the joystick to control the direction of the shot. The logic flow of the ball shooting game is the following. First, the goalkeeper chooses a side to defend, and this signal is stored. Then, the shooter will adjust the direction of the shot, and press shot, which are delayed for 0.5 second, while the left/right defense board will turn in that direction as soon as the shot button is pressed. The ultrasonic sensor will be constantly detecting the distance between two goal posts. If a different distance is measured at one instance (which means the ball passes by the goal line), this means the attacker scores one goal. A message will be printed to the screen to say which side scored via UART/Bluetooth.

Peripherals

- Joystick
- Ultrasonic sensor
- Stepper Motor (PWM)
- Bluetooth
- Motor (5600RPM)

Serial Interface Protocols

- UART/Bluetooth (for score display)
- I2C (for joystick)

Responsibilities

Our group has two people, both of us are responsible for the software and hardware implementation. For software, Huake He will be mainly focusing on implementing the Bluetooth module, and Changsheng Su will be focusing on the joystick control. For hardware, Huake will handle the defense part, which is two step motors controlling the two sides to defense; Changsheng will handle the shooting part, which is one step motor for direction adjustments and two motors for ball shooting.

Software structure

The game logic is implemented in a while loop. The defender will first trigger a signal for a selected defense side. The side signal is stored, and wait until the attacker to determine the direction and shoot to trigger the interrupt to switch the defense board. Then the sensor determines if scored or not, and sends the signal to be printed on the console.

Block Diagram

