

Description

Interactive “hunting” game made for CMU Spring Carnival 2011, representing Taiwanese Student Association’s Oregon Trail Booth. The game was a two-player versus game, where each player is given a trigger-activated laser gun. Targets mounted along the interior wall of the booth are shot at until either the timer runs out or one player hits all targets. Points for each target decay as a function of time.

Hardware

Laser Gun

A laser circuit is inserted into the stock of a Western style rifle. These guns contain power and ground lines that are tethered to an arduino. A third signal line is also tethered for both guns in order to indicate when the user is shooting (this is done by attaching a wire to the “Normally Open” pin of the switch).

FSM Start Button

Button held down by the person supervising the game in order to begin the game. On the software side, holding down the button for 5 seconds transitions the FSM from idle to game. After game ends, the FSM automatically transitions back to idle.

Software

Arduino

Used to read analog input from the signals and digital input from the gun triggers.

StandardFirmata

Code run on the arduino’s ATmega328 in order to interface via Processing.

Processing

Interfaced with Arduino through StandardFirmata. Standard Firmata allows me to read arduino signals while simultaneously combining it with the graphic capabilities of Processing. Includes GUI, Player, and Animal classes. Borrowed a Timer class from online and modified to recognize my time necessities.

To be added to documentation:

- Circuit diagram for arduino wiring
- Circuit diagram for laser
- Circuit diagram for targets
- Documentation for toy gun hacking and target construction
- FSM diagram
- Parts list

To be added for game:

- Self calibration for the targets by using a simple learning algorithm: keep track of the ambient values while in the idle state of the game's FSM, and automatically set the thresholds when the FSM transitions from idle to game state (currently the thresholds require manual calibration). Throw out any outliers that are greater than a certain range, and take the average of all other values.