

Final Project Checklist- Major Modules

-Smart Glove (Matt)

This module will use two flex sensors and an accelerometer attached to the glove the player is wearing to determine the hand's orientation and whether it is open or not.

Testing Points:

- Sends a reliable open/closed signal that is synchronized to the system clock – easily testable with an oscilloscope
- Sends a reliable signal when the glove is in an orientation that can acceptably catch the ball – easily testable with an oscilloscope
- (Stretch) Complete hand-tracking with the accelerometer – testable with the display module

-Hand-Tracking Detection Module (Evangelos)

This module will process camera input to determine the position of the player's hand, so that throwing and catching can be tracked. Will include module to correct glitchy signals if necessary.

Testing Points:

- Sends the (x,y) coordinates of the center of the glove reliably both when hand is static and when it is moving/ will check this on a frame by frame test of the real video vs what is shown on the screen
- The (x,y) point should move smoothly in our coordinate system

-Physics and Display Module (Michael)

This module takes the input from the Smart Glove and Hand-Tracking modules, generates the game state, and displays it on the screen. It will implement realistic 2D physics on the ball, while the display will consist of two hand sprites and a ball with a black background.

Testing Points:

- The ball follows the expected parabolic motion when given an initial velocity manually
- The ball is given an initial velocity upwards and can be caught by a hand underneath it
- Throwing can be shown with hand movement as button inputs

-Communication between FPGA's (everyone)

If two cameras connected to two separate FPGA's are used, we will need to send tracking data to the master FPGA. We will use parallel wires if possible or a serial port if necessary.

Testing:

- We need to show data changing at 60Hz transmitted reliably over the connection. If hand-tracking works, we can use that data

-Sound Module (everyone)

Throwing and catching will trigger appropriate sound events.

If Time Permits

-Extra Game Modes

A floor and/or walls, Dodgeball, choking Storm Troopers.

-Single Camera Tracking

If possible and convenient, we might track both players with a single camera.