

6.111 Introductory Digital Systems Laboratory

Final Project Proposal: AirPong

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1 Commitment

1.1 Camera/Display Modules

- Generate discrete (x,y) coordinates for player 1 paddle.
- Generate discrete (x,y) coordinates for player 2 paddle.
- Generate discrete (x,y) coordinates for puck.
- Display vector graphics of paddles and puck on monitor.
- Display vector graphic of play area boundaries on monitor.

1.2 Controls Modules

- Accept discrete (x,y) coordinates for both player paddles and puck position
- Generate discrete (x,y) puck velocity commands.
- Translate discrete (x,y) puck velocities to real-world analog velocities using static gain.

1.3 Comms Modules

- Translate commanded (x,y) velocities into proper drone commands.
- Serialize commands.
- Transmit to and interface with BLE module.

2 Goal

2.1 Camera/Display Modules

- Superimpose aforementioned vector graphics on top of live video feed.

2.2 Controls Modules

- Generate state estimation based on sensor data received from drone.

2.3 Comms Modules

- Receive sensor data packets from drone via BLE module.
- Depacketize sensor data and forward to controls module.

3 Stretch Goal(s)

- Full FPGA Control
- 2-3 Drones
- 3D/vertical movement capability
- Sound Effects (Stored in Flash)