

# Virtual Air Hockey

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# Concept

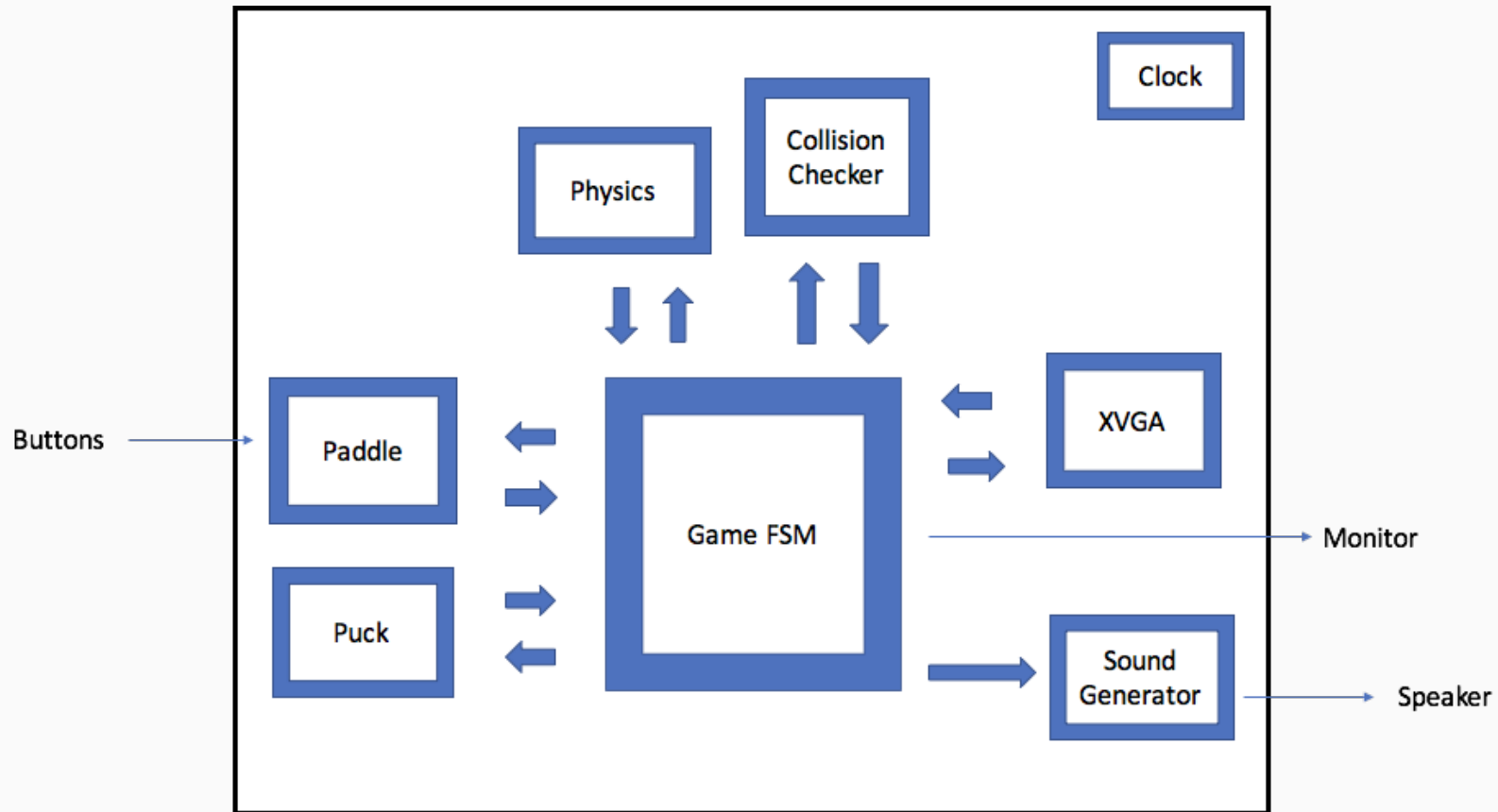
**Commitment**: Single-player, labkit button controlled paddle

**Goal**: Two-player, controller input for paddle movement, sound

**Stretch**: Overhead camera paddle position input



# Block Diagram



# Modules

## **Puck** (Matt)

Inputs: [10:0]x, [10:0]hcount, [9:0]y, [9:0]vcount

Outputs: [23:0]pixel

Given the puck position and current hcount/vcount, the puck module determines what pixel should be drawn of the puck.

## **Paddle** (Justin)

Inputs: [10:0]x, [10:0]hcount, [9:0]y, [9:0]vcount

Outputs: [23:0]pixel

Given the paddle position and current hcount/vcount, the puck module determines what pixel should be drawn of the puck.

## **XVGA**

Inputs: vclock

Outputs: [10:0]hcount, [9:0]vcount, vsync, hsync, blank

A basic XVGA module will generate all of the necessary XVGA timing signals.

# Modules

## **Game Finite State Machine** (Justin)

Inputs: puck positions, paddle positions,  
velocity,  
friction, board  
Outputs: Scores, positions

## **Sound Generator** (Justin)

Input: Sound signal, Sound type  
Output: Sound

## **Collision Checker** (Matt)

Input: [10:0]puck\_x, [9:0]puck\_y,  
[10:0]paddle\_x,  
[9:0]paddle\_y  
Output: [1:0]collision\_type

Calculate whether the puck has collided with nothing, a wall, the paddle, or entered the goal opening in the wall.

## **Physics** (Matt)

Input: positions, board, friction, force, angle of  
paddle  
Output: [10:0]puck\_x, [9:0]puck\_y,  
[5:0]puck\_vx,  
[5:0]puck\_vy

# Timeline

## **Week of Nov 5**

Puck / Paddle / XVGA

## **Week of Nov 12**

Physics / Game FSM

## **Week of Nov 19**

Collision Detection / Scoring / Sound

## **Week of Nov 26**

Controller Input for Paddle Movement

## **Week of Dec 3**

Add 2nd Player Support

## **Week of Dec 10**

Final Polishing / Testing / Final Report

Questions?