Project Title: Squash Yourself
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TA Name: Cassie Huang
TA Signature/Date:

Sumit:

Inputs:
1) Decode YCrCb input from the camera, convert it to RGB, and output the signal to a VGA
2) Detect the location of an LED and its center of mass and track movements of the LED
3) Determine the acceleration of the LED over a few frames to determine the power of the swing
4) Change the size of the paddle via buttons on the labkit.
* If time - Calculate the movement vector of the LED over a few signals to determine the angle of the swing
  Repeat for a second LED

Azadeh:

Scorekeeper:
1) Increment player points and determine hits per point
   * If time –
     * Change server appropriately
     * Determine whether a hit is legitimate (i.e. if the hitter and server are correctly paired)

Game Physics
1) (internally) chart size and location of both ball and paddle
2) Collision detection (coordinate overlap?)
3) Show 3D ball movement
4) Increase ball speed based on paddle power
5) Additionally increase ball speed based on ball “heat”
   * If time-
     * Direct ball based on paddle angle
     * 2-player version
Will:

**Video Output:**
1) Display stationary background, including court and scoreboard.
2) Display the ball with size and location specified by Azadeh’s Game Physics
3) Display ball HEAT with a bar that increases
4) Display Player 1 Score (P1 Score) and Player 2 Score (P2 Score) with two decimal digits displayed as digital seven segment displays. Also display a 3 digit decimal display for Rally (how many hits per point).
   *If time-* Add displays for Game Over. Also, maybe add a start screen.
   Make images more complex. If video has glitches, put some of the display into ROM and/or create a frame buffer.

**Audio Output:**
1) Create audio clips for Server Change (Player 1 or Player 2), Hits, End of a Point, End of a Game, and Power Hits.
2) These audio clips will be programmed using labkit switches and a button on the labkit and stored into BRAM.
3) Cause the audio clips to play at the appropriate times based on the data sent from Azadeh’s Scorekeeper.
   *If time-* Add an audio clip for taunting the opponent. This will also be stored on BRAM, but will play based on a user button press.