

CV Robotic Desk Lamp

Commitment:

CV:

- Pipe video feed into frame buffer
- Identify X, Y coordinates of 3 LEDs on puck
- Generate “center-of-mass” X, Y of LED's

Robotics:

- Use CV output to generate pose of arm/projector to track puck in one-dimension
- Command servos to move arm to match this pose

Keystone correction/software:

- Display vector graphics based notification icons
- Correct keystone based on the angle of the robotic arm
- Receive notification pings from a connected computer

Goal:

CV:

- Convert X, Y coordinates into a X, Y, Theta to be used as commands in different modules.

Robotics:

- Move projector to track puck in two-dimensions on surface
- Minimize “jiggle” of arm by placing minimum error bounds for movement

Keystone correction/software:

- Receive and display full text of notifications from computer
- Scroll through notification text using the puck's theta from CV

Stretch:

CV:

- Identify when LED's are covered as a means of additional input (clicks).

Robotics:

- Adjust arm dynamically to maintain constant projection size, or adjust projection size based on commands from the FPGA button inputs
- Implement rudimentary PID controller for control of angles based on error from CV.

Keystone correction/software:

- Add Sound to give personality
- Transmit images from computer to display when no notifications are available