



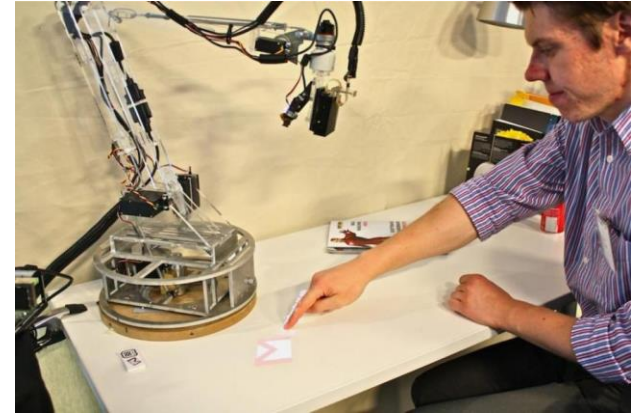
Robotic Desk Lamp & Projector

6.111 Fall 2017

Jack Erdozain
Nicholas Klugman
Mark Vrablic

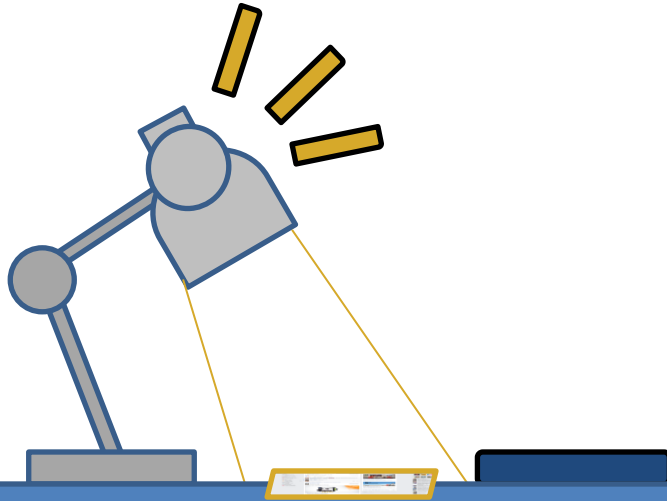
Inspiration

- LuminAR, Media Lab

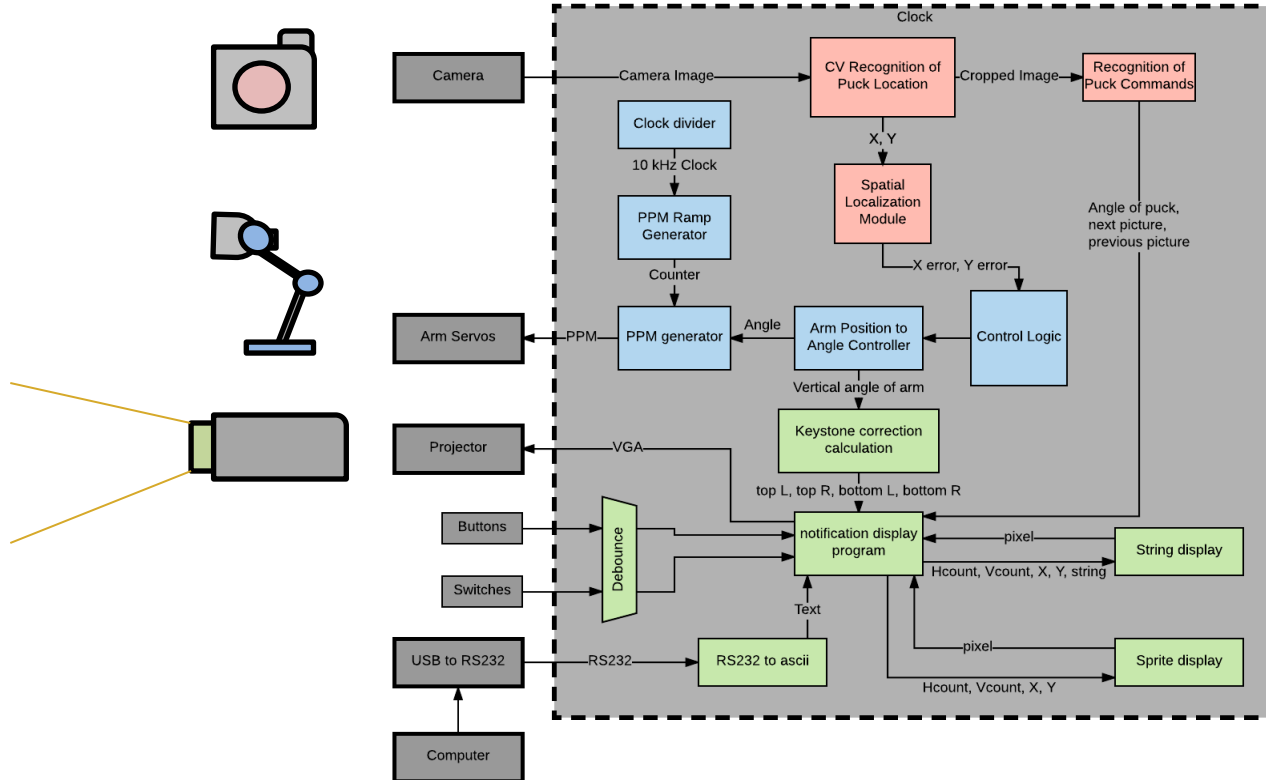


Our Project

- Uses CV to track a “puck” as the input device
- Arm moves to react to puck, move projection
- Projects a distortion free image

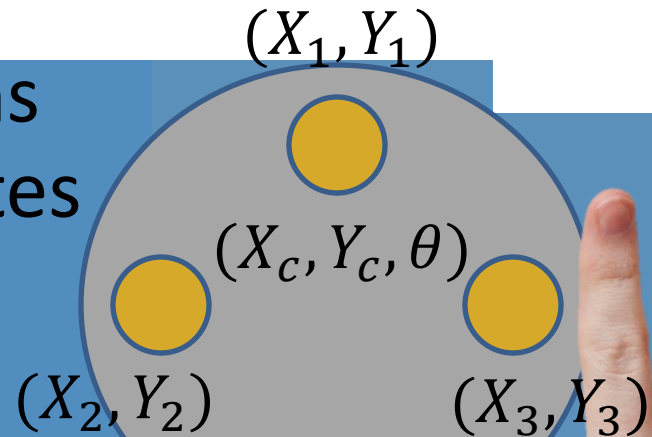


Big Picture



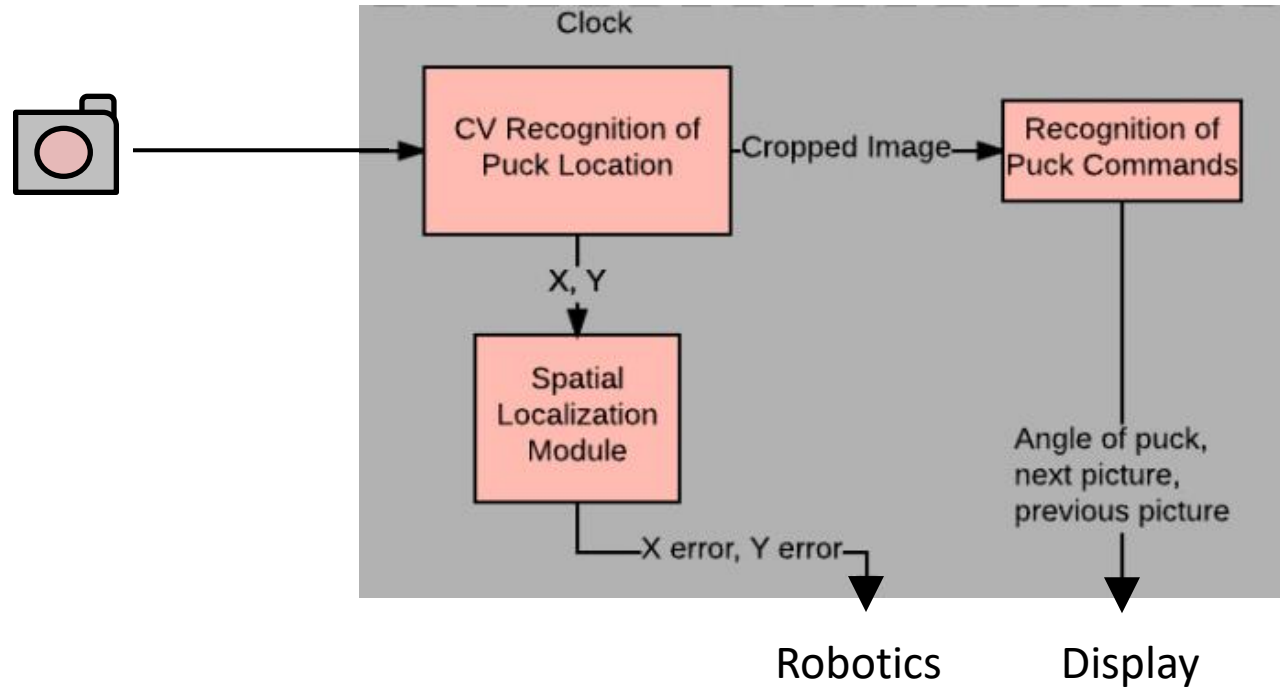
Computer Vision Problems

- Object detection is hard
- So lets remove distractions
- Else Produce unique coordinates
- Derive pose of object
(Center X, Center Y, Theta)



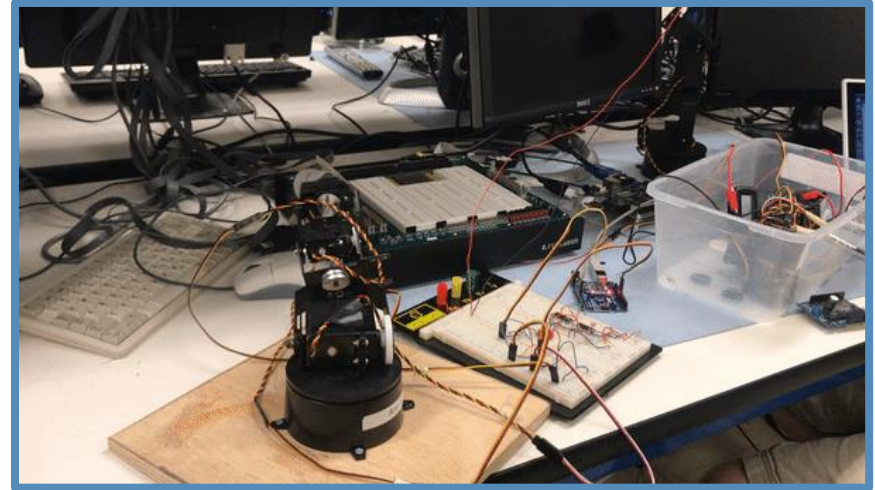
Puck

Computer Vision Implementation

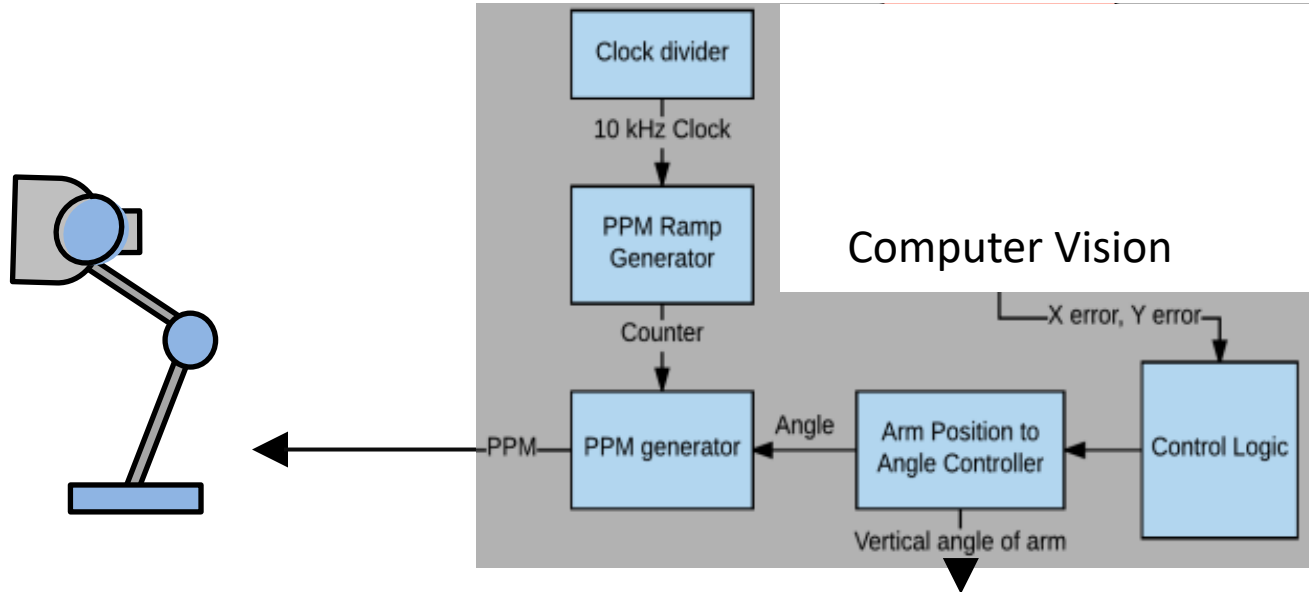


Robotics Problems

- Servo control using PPM
- Path planning based on error in puck position

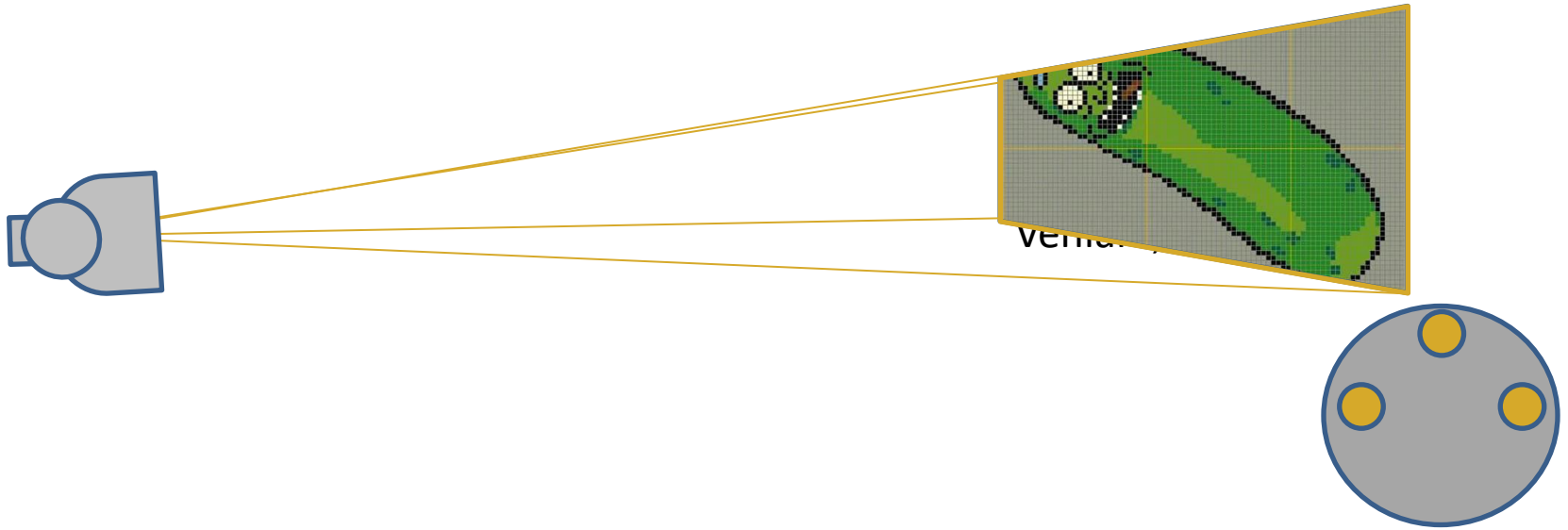


Robotics Implementation

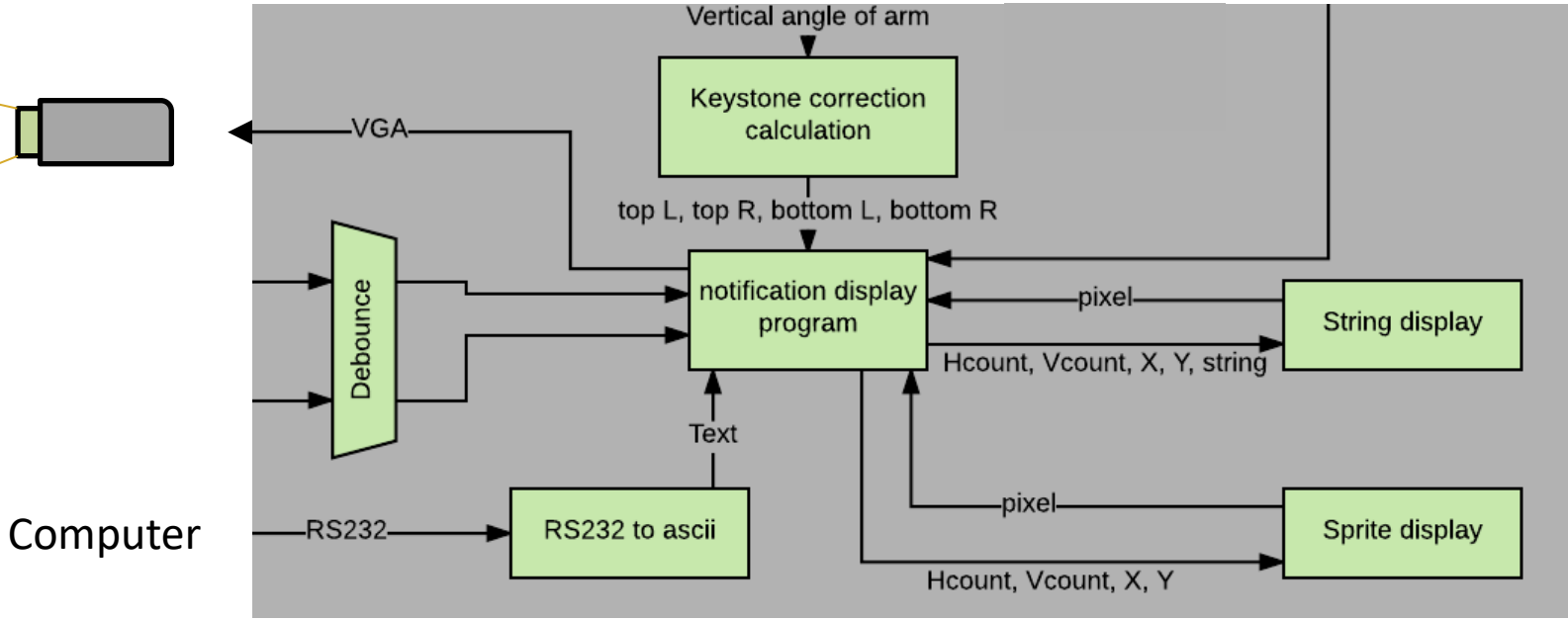


Notification Display Problem

- Keystoning



Notification Display Implementation



Timeline

Week	CV	Robotics	Image Processing	All
11/5-11/11	Get video feed piped to VGA	Get robotic arm hardware working	Keystone Pong	11/9 - Project Design Presentation
11/12-11/18	Recognized IR Clusters, assign X, Y positions	Generate PPM from commanded angles	Add text and create vector icons	By 11/17 - Final Proposal Revision By 11/18 - Checkoff Checklist Meeting
11/19-11/25	Recognized IR Clusters, assign X, Y positions	X, Y error to servo angles calculation	Read serial from computer for notifications	Thanksgiving
11/26-12/2	Generate Poise, Generate Commands	Debug	Debug	Integrate
12/3-12/9	Debug	Debug	Debug	Merge
12/10-12/13				Project Checkoff, demo, and report due