Final Project

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ECE478

Introduction

This report contains a detailed explanation of the Final project for the Marie Curie group.
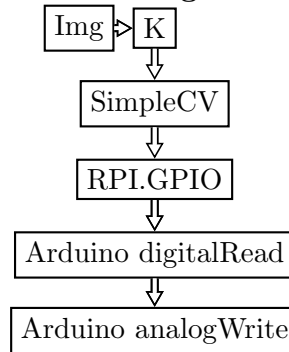
Goals

1. Use an arduino to drive the servo controller

2. Use a raspberry pi 2 to do image processing with a kinect

3. Interface raspberry pi 2 and arduino

4. Implement some sort of behavior in the robot based on

5. Add mechanical support for shoulders

High level system model
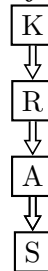
- K = kinect
- R = raspberry pi 2
- A = Arduino
- S = Servo controller

Model of algorithm

```
┌─────┐   ┌───┐
│ Img │ ▷ │ K │
└─────┘   └───┘
             ⇓
        ┌──────────┐
        │ SimpleCV │
        └──────────┘
             ⇓
        ┌──────────┐
        │ RPI.GPIO │
        └──────────┘
             ⇓
    ┌──────────────────┐
    │ Arduino digitalRead │
    └──────────────────┘
             ⇓
    ┌───────────────────┐
    │ Arduino analogWrite │
    └───────────────────┘
```

- Img = Image

- K = kinect

- SimpleCV = Python wrappers for OpenCV

- RPI.GPIO = Python wrappers for controlling Raspberry Pi GPIO pins

- Arduino digitalRead = Arduino function to read if pin is high or low

- Arduino analogWrite = Arduino function for Pulse Width Modulation on capable pin