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CS5590BD - SG3 - Lab 4

Lab 4 Report SG3

We started out by utilizing the gyroscope/motion sensors in the iPhone to read and detect the position and angle the iPhone. To collect sensor data, we used the CoreMotion library. A code snippet to collect gyroscope data is as follows:

[self.motionManager startGyroUpdatesToQueue:[NSOperationQueue currentQueue] withHandler:^(CMGyroData \*gyroData, NSError \*error) {

[self outputRotationData:gyroData.rotationRate];

}];

We calculated the pitch, roll, and yaw and rate of change along the x,y,z axis. We had five states: 1) Romo is beginning on a flat surface, 2) Romo is climbing up the ramp, 3) Romo is at the top. While the Romo is at the top we use the Twitter REST service to tweet it’s at the top at the specific time. 4) Our Romo is descending at a decreased rate, and 5) Our romo is finished, and uses Image Processing via OpenCV to detect the color red and stop.

For OpenCV, we utilized the AV Video API to access the camera and continuously take video while applying the circle detection recognition algorithm to detect the specific hue of the color red. When a red object is found, the algorithm circles it, puts it into a list of circles. We detect if a circle exists (circles >= 1) and we use that data to instruct the Romo to stop.