

To: Dr. Dean

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Subject: Weekly Status Report

Date: April 18, 2017

We are still tweaking the controls and tracking algorithms. We are also designing and building the arm for the tracking camera.

Last week, we spent most of the time trying to optimize the controls algorithm. Using the advice from Dr. Hung, we calculated 12 sets of constant values to test in our phase-lead compensator. We hung a pink shirt in the hallway and tested each set to try to find the best set to use. We programmed the raspberry pi so that when we would connect a certain pin to voltage it would change to the next set of constants. We did this so that we didn't have to take the SD card out of the pi each time to change to the next set of constants. However, not knowing if the constants were changing proved to be a problem. So now we are going to go back to taking the SD card out each time to find the best set of constants to use for our controls algorithm. We did find out that setting the error to 0 pixels works better than an error of 50 pixels. We have also been tweaking our tracking algorithm. We are experimenting with HSV color values instead of RGB color values. Bowen, one of Dr. Roppel's graduate students, met with us to try and help us with some of the problems we have been having. He suggested that we look at the picamera settings like the gain, contrast, and exposure, to see if they are effecting our tracking. We are looking into this to see if it will improve our tracking. Lastly, we have built the arm for the tracking camera. The camera sits on a hinge that we can adjust to get the desired angle.

We believe that our tracking system is the reason that the robot is oscillating. We are going to optimize the tracking system, then adjust the controls system appropriately.