ME 410 - Week 10 Summary

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Summary

This week, we continued working on the final milestones for this quarter, picking up from the previous week on autonomous x, y control.

At the end of last week, we had added the derivative control components to the controller, but had yet to test it. Upon testing and adjusting gains, our results improved slightly, but we were not seeing the improvement we had hoped for. After some checking, we realized that our derivative control terms were in the opposite directions. We corrected these signs and continued testing and saw some improvements, but still not adequate enough for the performance goals that we wanted. Sometimes the drone would move rapidly as if our gains were too high, so we would lower the gains. Then we would test again with the new gains, and it seemed like they were not high enough to get the drone moving in the proper direction towards the marker. I think at their core our logic and calculations are correct and we have verified that the generated pitch and roll angles from this controller have the correct sign in different scenarios, but we need to do a lot of tuning to get the autonomous x, y control to function correctly.

Assessment - What Went Well

This week was not very productive. It mainly consisted of testing gain combinations and debugging our code to make sure our controller was functioning as intended. Although we did not make much progress, it was a useful experience to spend time debugging controllers.

Assessment - What Did Not Go Well

A lot did not go well this week. At a high level, we got the autonomous x, y control working very slightly, but not working well enough to complete the milestone. With more time and tuning outside of class, I think we may have achieved this milestone, but we had some other priorities.

Assessment - Adjustments for Next Class

I know this was our last class, but going forward this experience can be useful when we have to design or debug controllers in the future. If adjusting gains is not affecting the performance as we expect, some more debugging is most likely necessary.

Team Member Effort

Me - 51% (Edited .cpp file on my laptop; Kept batteries charging; helped with debugging)
Ben - 49% (Helped with .cpp file; helped with debugging)