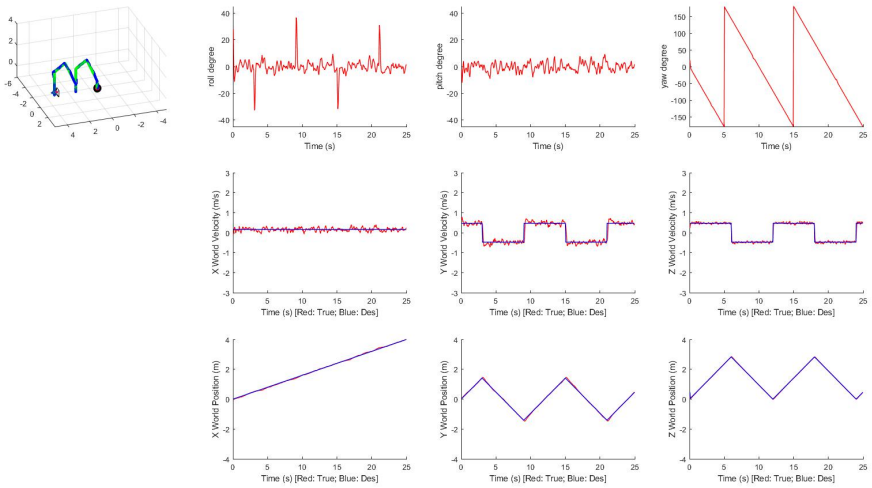
Project 1 Phase 1

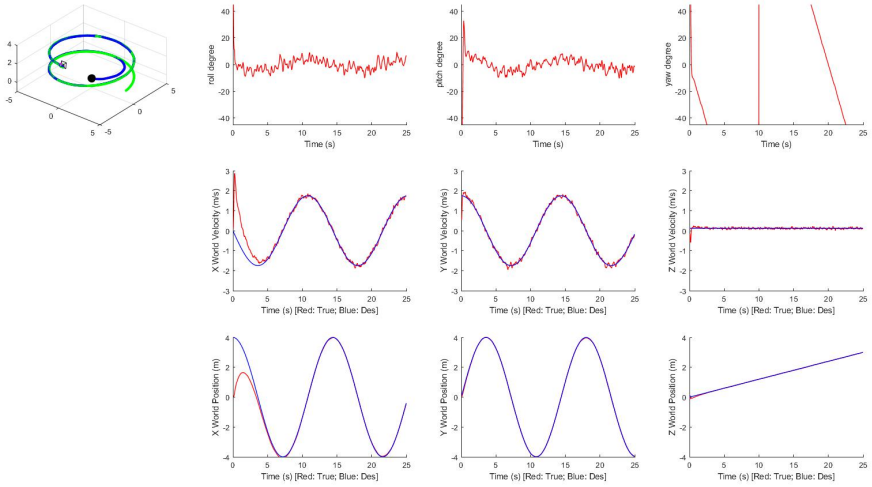
FENG Chen

1. Figures

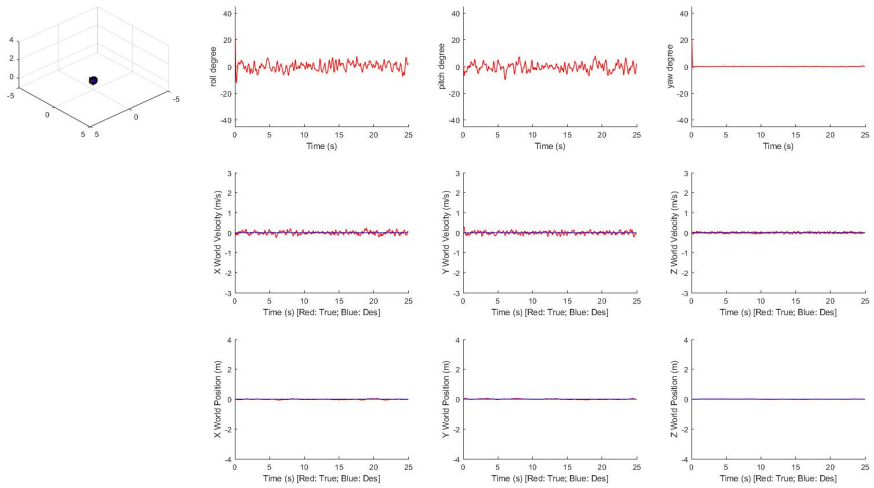
Diamond trajectory:



Circle trajectory:



Hover trajectory:



2. Statistics about controller

	Position_RMS	Velocity_RMS
Diamond	0.050489	0.18592
Circle	0.72557	0.49507
Hover	0.03533	0.1116

3. Analysis

Actually, I think tuning hyper-parameters is the most important and time-consuming part in this task. I use Ziegler-Nichols Method introduced in class to adjust proportional parameter of each position and attitude. But I found they should not be the same so I turned their Kp following some proportion. And then I did derivative parameter according to this method. However, it still needs manual tuning to make the control system to have a better performance.

4. Other thoughts

During the adjusting period, I found I couldn't make the system perform best in every case and I have to do some neutralization for whole good performance. Especially, I think PID control can't fit smooth trajectory like circle case, which leads to high RMSE. Therefore, we can take some other advanced non-linear control algorithm to make better performance, not just local linearization.