ELEC5660 Project 1 Phase 2 Report
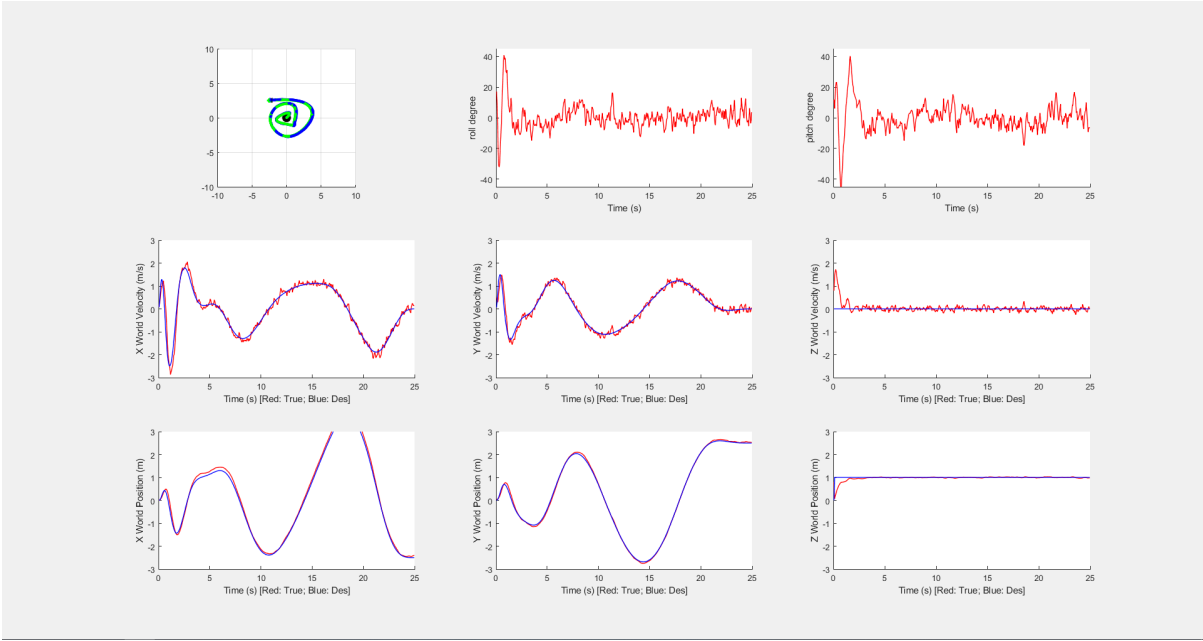
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Method used
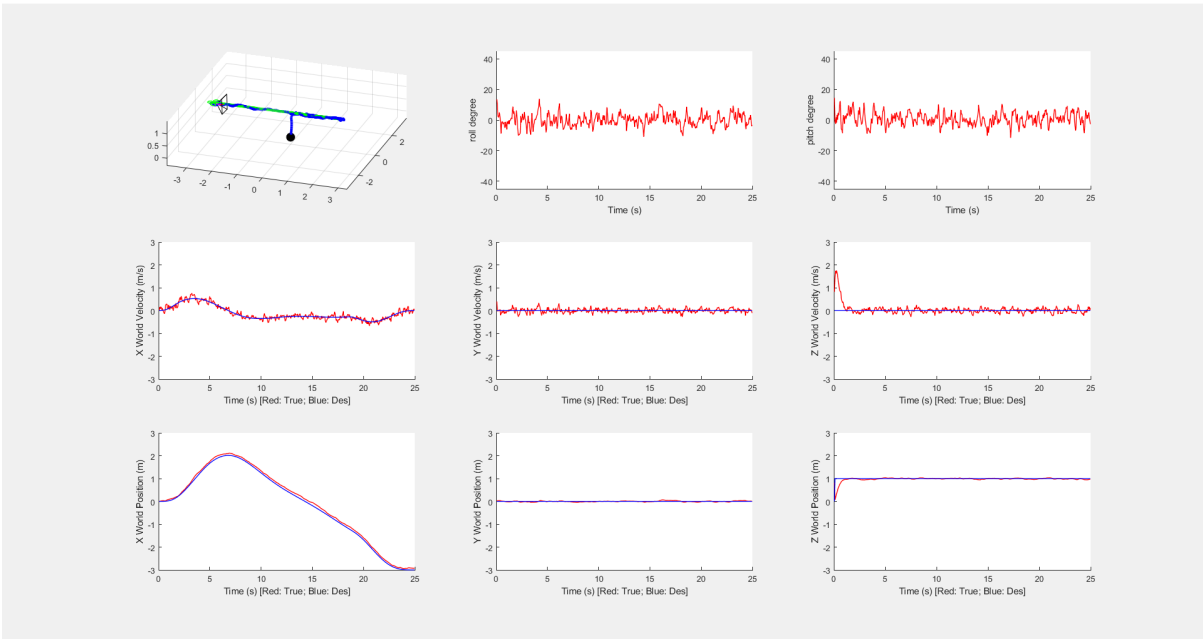
This report is using the quadprog function provided by matlab to do the optimization of the constrained QP problem.
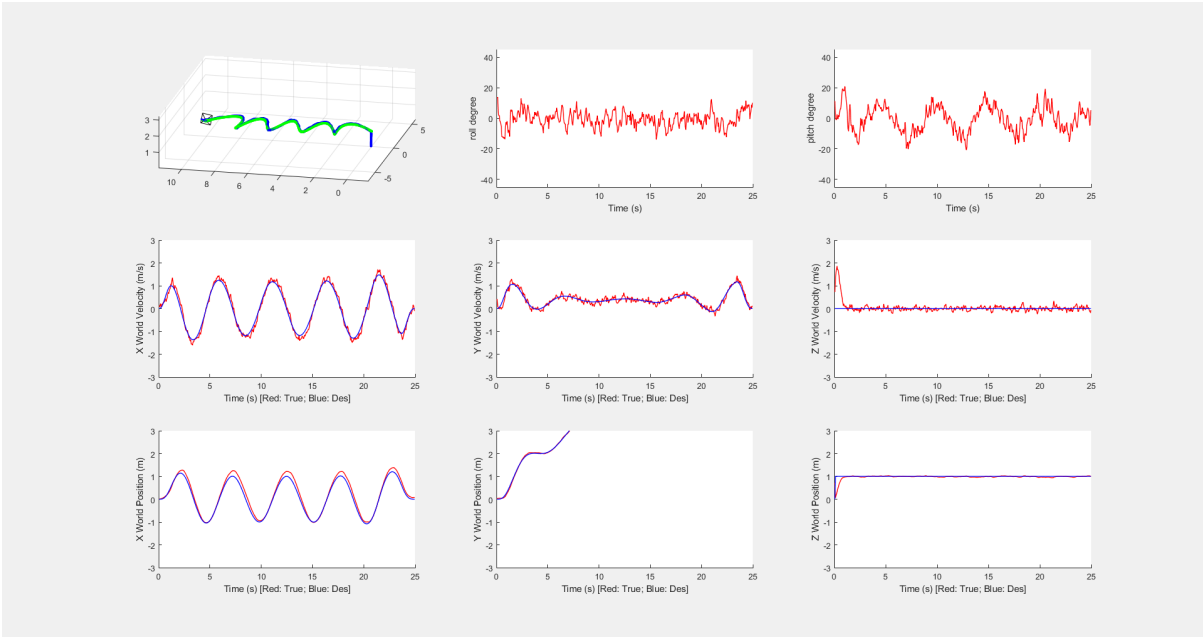
Plotted figures

path1

path2

path3

Controller statistic

Change in PID parameter

The PID parameter in the previous phase is not stiff enough. Change a bit to make the drone more responsive.

	x	y	z	roll	pitch	yaw
Kp	10	10	20	3200	3200	3200
Kd	8	8	8	90	90	90

RMS Error

RMS error	x	y	z	v_x	v_y	v_z	phi	theta	psi
path1	0.1230	0.0534	0.1128	0.1859	0.1393	0.2183	0.0494	0.0494	0.0234
path2	0.0872	0.0221	0.1072	0.0902	0.0899	0.2369	0.0469	0.0466	0.0225
path3	0.1380	0.0359	0.1065	0.1420	0.1007	0.2440	0.0458	0.0474	0.0229

Time allocation strategies

Two time allocation strategies are used in this report. The first one is allocate the time equally using number of waypoints. The second one is allocate the time according to the distance between waypoints.

For the path given in the project, less difference can be seen between the two strategies since the distance between waypoints are not significant. However, for the path with more waypoints and waypoints with larger distance difference, the first strategy will cause the drone to fly too fast.

Result analysis

The result is acceptable, for the simulator and proposed trajectory, the drone can followed quite well.

Others

Don't open copilot when you are typing equations. It will add/delete things behind your back.