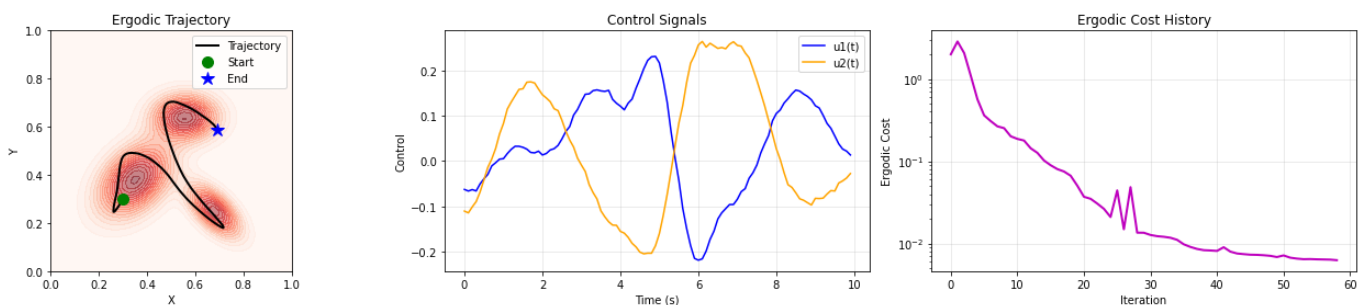# ME455 HW45- Zhengyang Kris Weng Submission

05/30/2025
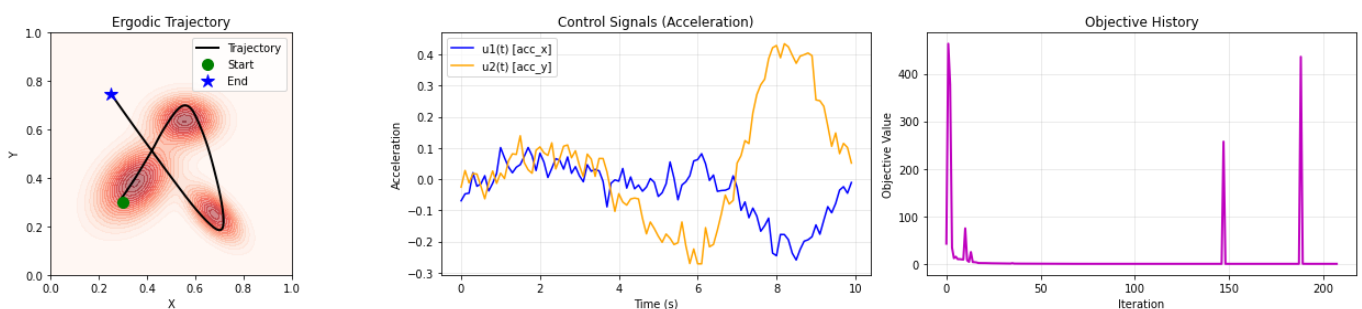
1. Generate an ergodic trajectory with a time horizon of 10 seconds with dt= 0.1s.

Wow this was a really tough one!! I struggled *a lot* calculating coefficients and formulating ergodic metric, balancing regularization and number of basis functions - until I looked at the provided notebook lol.

2. Generate an ergodic trajectory with the same specifications from the last problem, but with the system dynamics being a second-order system

Boundary reflection was quite tricky - too small a step also fails line search but too large will make it OOB and evantually converges to trajectories that don't make sense.

3. Generate an ergodic trajectory With the same specifications from the last problem,but with the system being a differential-drive vehicle and initial condition being [0.3,0.3,pi/2]. Note that you only need to evaluate the ergodic metric over the x,y position of the robot.

I could arguably make the diff-drive dynamics better but I'm about to pass out so here it is.