EML 6350 Fall 2021

This is project is open book and open notes and is due December 3rd. **You can work with one partner as well**. Copying someone else's code or solution is considered a violation of the university honesty policy. **UPLOAD A SINGLE PDF OF YOUR SOLUTIONS AND YOUR CODE IN A SINGLE ZIP FILE ONLINE**

1. The goal of this project is to get you familiar with reading papers and implementing what you have read. For this project, choose a nonlinear controls paper that uses Lyapunov-based analysis to prove stability. This paper can be a paper you are currently writing as well. For this project:

   - **(10 points) type** up a brief introduction of the problem (enough for someone unfamiliar with the problem to understand)
   - **(35 points) type or hand write** an analysis of the system using the controller the paper used (if hand written it must be legible)
   - **(35 points) implement** the controller in a Monte Carlo simulation using at least 100 random variations of the parameters in the dynamics (can use Matlab, Python, etc)
   - **(15 points) type** a discussion of your results and compare them to the results in the paper (e.g., describe why you think the results are good or bad using the data from your simulations compared to their simulations or experiments)
     - **plot** the results you think are important to support your claims (in addition to plots you could use tables but ensure they are easy to understand)
   - **(5 points) type** your conclusions for the paper and discuss any potential extensions you think would be interesting and why.

If you cannot find a paper you are welcome to implement a CL version of my JOE_ICL paper that is uploaded in the Files tab. The primary difference will be you must assume the acceleration is measurable to implement CL vs ICL which doesn't require that assumption (which is an okay assumption for this project). If you have any questions, please ask.