MAE 3260 Final Group Work: Exploring a System of Interest

Proposal

Title: System Dynamic Modeling of an Off-Road Suspension Shock

Topic of Interest: Off-road Suspension System

Abstract:
We are choosing to dissect and test the shock from a small off-road vehicle's suspension system. Our goal is to empirically determine the different system parameters, such as damping, mass, and spring constant, and then find the system's transfer function and find the bode plots to determine system response. We will then compare this model to the values we've seen in the various assignment problems that analyze passenger vehicle suspensions to see how our assumptions might change given this specific application and the smaller size of the vehicle whose suspension we are studying.

Students/Roles:

Student	**Task/Role**
Name of student	1-3 sentences for what the student plans to work on, what skills in the class they will use/build upon, what they expect the final result to look like
Greg Svensson	I plan to take the shock apart, analyze the data, and do the comparison. I will use skills like passive design analysis, system modeling, and analytical data comparison. The final result should be a simplified model of the shock and a comprehensive comparison.
Ava Rosenow	I plan to work on shock dissection and dynamometer data analysis.
Aniket Martins	I plan to work specifically on making/analyzing the bode plots for our shock system. As we have discussed, we will work on everything together as a group so I will work on taking the shock apart as well.
Tavan Bhatia	I plan to help write the equations of motion for the shock absorber system, with 1 DOF.

Interdependencies:

- We will work together on everything

Non-exhaustive list of concepts or skills to explore and demonstrate:

- Models:
    - ODEs
    - Transfer Functions
    - Bode Plots
- Open-loop system:
    - Parameter estimation
    - Passive design