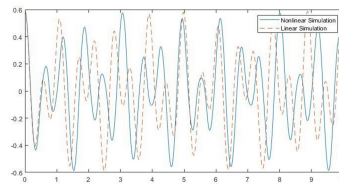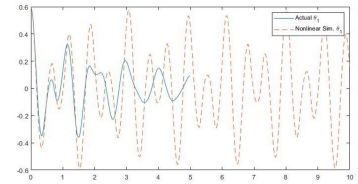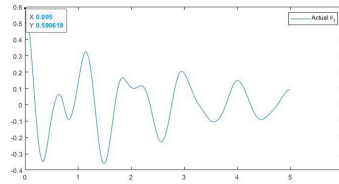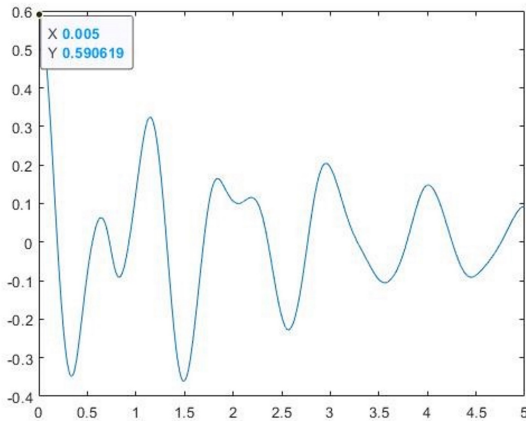# Lab 8 Post-lab

1. Attach the print outs of experimental and simulated data generated in Experiment II.
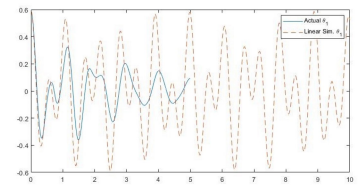
2. Comment on the validity of the linear approximation as a function of the magnitude of the initial displacement θ_1. Justify your answer by referring to the plots of experimental and simulated data.

> The trend of linear approximation is very similar to the non-linear simulation at the beginning. But after 7 sec they look very different

3. Comment on the validity of the mathematical model as an approximation of the experimental system. Suggest two physical effects that are not included in the mathematical model that could be included to improve its applicability.

> Two physical effects not included:
>   1). Air drag
>   2). Friction force at joints
>
> The mathematical model 70% fits the real data, especially at the beginning. But as time goes by the model start to deviate from the real data.

4. What could be improved in the ME340 labs? Do not remark on your TA. Try to focus your response on the lab manuals, pre-lab assignments, report assignments, experiments, and equipment.

I think the only problem ME340 lab might have is that the lab is not strongly relates to the lecture

5. What should not be changed in ME340 labs?

I think the way arranging the lab manual should not be changed. Start from knowledge introduction to practices and finally the lab procedures.

6. Identify the two labs that were the most difficult to understand.

- Lab 1: Mathematical preliminaries, MATLAB
- Lab 2: First-order systems, leaking tank, hydraulic motor
- Lab 3: Block diagrams and simulation, SIMULINK
- Lab 4: Second-order systems, single-degree-of-freedom mass-spring-damper mechanisms
- Lab 5: Mode shapes and resonance, two-degree-of-freedom mass-spring-damper mechanisms
- Lab 6: Continuous systems, vibrating beam
- Lab 7: Nonlinear systems, Pendubot, Lagrange equations

Lab 2
Because we were not familiar with the simulink at first

Lab 3
The pre-lab of lab3 is very long. And there are much data in the lab session that we need to record and analyze.