

MAE 566

System Identification

Homework 1 (Due:1/25)

A lab test is carried out to determine the model for a spring. The experiment include a position and force measuring transducer. Data is collected for compression and expansion of the spring. The force transducer is noisy and the collected data is given below. Identify a model for the spring and plot the results of the estimated model.

The data from the test can be downloaded from the home page by typing *<http://wings.buffalo.edu/academic/department/eng/mae/courses/sys500ID/rawdata>* in the location window, which will bring up the data file. You can use the *Save As* option under *File* to save the data file.

Displacement	Force
-1.0000000e+00	-4.5938607e+00
-9.5000000e-01	-4.3338098e+00
-9.0000000e-01	-4.0618677e+00
-8.5000000e-01	-3.2342100e+00
-8.0000000e-01	-2.5811971e+00
-7.5000000e-01	-2.1617122e+00
-7.0000000e-01	-1.8319959e+00
-6.5000000e-01	-1.4558920e+00
-6.0000000e-01	-1.3815675e+00
-5.5000000e-01	-1.5444574e+00
-5.0000000e-01	-1.6318646e+00
-4.5000000e-01	-1.4027035e+00
-4.0000000e-01	-4.0797837e-01
-3.5000000e-01	-6.8614453e-01
-3.0000000e-01	-8.5512222e-01
-2.5000000e-01	-5.2889494e-01
-2.0000000e-01	-1.6061348e-02
-1.5000000e-01	-6.0833069e-01
-1.0000000e-01	-3.4156784e-01
-5.0000000e-02	2.3750876e-01
0.0000000e+00	-2.0661655e-01
5.0000000e-02	-3.3964852e-01
1.0000000e-01	5.9150874e-01
1.5000000e-01	-8.2425346e-02
2.0000000e-01	2.3237261e-01
2.5000000e-01	4.3601078e-01
3.0000000e-01	8.7727399e-01
3.5000000e-01	6.0290801e-01
4.0000000e-01	1.1398272e+00
4.5000000e-01	5.3097703e-01
5.0000000e-01	1.6566566e+00
5.5000000e-01	1.7673158e+00
6.0000000e-01	2.1375137e+00
6.5000000e-01	1.6694968e+00
7.0000000e-01	2.2001149e+00
7.5000000e-01	2.3746125e+00
8.0000000e-01	2.4758017e+00
8.5000000e-01	3.1161683e+00
9.0000000e-01	3.9488754e+00
9.5000000e-01	4.7157525e+00
1.0000000e+00	4.3402727e+00