Physics 493L: Homework #2
Due February 9, 2014
10 points

The MATLAB file 'HW2_data.mat' contains the variables 'x', 'y_norm', and 'y_pois'. The variables 'y_norm' and y_pois' represent measured values at positions 'x'. The measurement process for 'y_norm' yielded measurements that are distributed normally (with a Gaussian distribution) about the true value. The measurement process for 'y_pois' yielded measurements that are Poisson distributed. The underlying model for both data sets is given by $y = A \sin^2(\omega x)$.

For each case, use fminsearch to make a maximum likelihood estimate for A and ω. Your solution should consist of a set of MATLAB *.m files. Depending on how you implement your solution, you may need between 1 and 3 *.m files. When your files are present in the same directory as 'HW2_data.mat', your solution must run, unaltered, and produce at least the following:

For each case, the estimated value for A and ω should be written to the command line as a human readable result using 'fprintf'.

For each case, the model generated from your estimated values should be plotted on top of the noisy data. Your plot must have axis labels and a legend.

For organizational purposes, please name your *.m files as 'LastName_HW2_Descriptor', e.g. 'Lidke_HW2_Main.m','Lidke_HW2_Func1.m', etc. Submit your results by e-mail to klidke@unm.edu with the subject line '493L HW2.'