**ECE 3522: Stochastic Processes in Signals and Systems**

# Computer Assignment (CA) No. 4: Model Fitting

The goal of this assignment is to demonstrate how you can model data using a parametric model of a pdf. Use both data sets (Google stock and speech data) for all tasks.

The tasks to be accomplished are:

1. Compute a histogram of the amplitude of the data and normalize it by the number of samples so that it is an estimate of the pdf.
2. Fit this distribution by estimating the mean and variance. Plot the Gaussian model on top of the histogram. Compare and contrast the quality of the fits to the data.
3. In (2), you should find that the Gaussian model is not a good fit for the Google data. Select another distribution from Chapter 4 that provides a better estimate of the data. Plot this model on the same graph with the histogram and the Gaussian fit. Compute the mean-squared error between the actual data and the parametric fit. Which gives a better approximation? (Do this for both data sets.)

We will soon learn that there are many ways to estimate and model the statistics of a signal. A Gaussian model is one of the most widely used models. Gaussian mixture distributions are even more popular :)