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

# Computer Assignment (CA) No. 2: REGRESSION and HISTOGRAMS

The goal of this assignment is to introduce you to some basic prediction functions.

The tasks to be accomplished are:

1. Building on your results from CA #1, and using the Google stock data with a frame size of 1 and a window size of 7, plot the signal data and overlay a plot of the mean value. Next, research and implement a linear regression function. Compute one regression model for the entire data set and plot it over the waveform. How does this compare to the plot of the mean values?

Later in the course we will discuss regression models. You might have used these in Excel when analyzing data.

1. For the speech signal, plot a histogram of the amplitude of the signal. Use a range of +/-32767.0 and a bin size of 10. Plot the number of samples in each bin as a function of the middle value of the bin. Your first bin should span the range [-5,5]. Your second bin [5, 15] and so forth. Do the same for negative amplitude values (e.g., [-15, -5]). Normalize the number of samples in each bin by the total number of samples in the file.

In a separate plot, plot the cumulative distribution.

Describe these plots. Do they make sense? What do they imply about the speech signal?