**ECE 3512: SignalS – Continuous and Discrete**

# Recitation No. 7: DTMF Detection

In this recitation, we will use this web site: <http://onlinetonegenerator.com>.

Record a sequence of DTMF signals. The simple way to do this is to use one laptop to generate the sounds, and another laptop to record them. There doesn’t seem to be a way to directly download a file containing the signal that you generated.

Pick a sequence of 4 random digits based on the sum of each group of four letters in your name. For example, if your name was “ABBA” (not my favorite music group, but they have the right name for this example), your sequence would be “1221” because we assign the index 1 to “A”, etc.

Generate a DTMF signal by waiting 0.5 secs, pressing the first digit for 0.25 secs, waiting 0.5 secs, pressing the second digit for 0.5 secs, waiting 0.25 secs, pressing the third digit for 0.1 secs, and waiting 0.25 secs and pressing the fourth digit for 0.1 secs. Your entire file should be several seconds long. The timing does not need to be exact, but make sure you vary the duration of the DTMF signals.

You have only one task for this lab: demonstrate using the fft function in MATLAB that you can detect the frequencies of these keystrokes in the signal.

At first, this might not seem difficult. But, you don’t really know where in the file these signals occur, and you really don’t know what frequencies they are at. You cannot use your prior knowledge of how the signal was generated. Assume you had no knowledge of that (like the exam problem).

Discuss all the issues you had to deal with and solve to be able to detect these signals for any file of any duration, any combinations of DTMF signals, etc. using a completely automated piece of software.

Hint: start with a spectrogram or waterfall plot to get some idea of what is in your file.