Lab 7 - Spectral Analyzer - GPGN 404 - Garrett Sickles - 27 November 2015

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1. **What is a spectrogram? What is its use?**

    - A spectrogram is a visual representation of the frequency content of a signal as a function of the temporal or spatial domain. Spectrograms are used to image changes in frequency, usually through time. Some applications of spectrograms are phonetic visualizations, seismographs, and music visualizers.

2. **Describe in a few sentences how you would implement one.**

    - First I would acquire the targeted data in digital form. Next I would convert the data into a format of evenly spaced times versus amplitudes. Next I would window the data by breaking it up into disjoint, adjacent, and equally sized subsets of the original data. Next I would apply a discrete fourier transform to these subsets of the data and use the nyquist frequency of the time data to construct frequency versus amplitude plots. Finally I would image the frequency versus amplitude content of the data in each subset and stitch all of these images together in either a heat map or video.

3. **Spectral Analyzer Code (**See *Lab07.m***)**

    - The code should display a single matlab window that updates as the fast fourier transform of each window is computed.
    - The code will output a video file named *animation.avi*.