UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Department of Electrical and Computer Engineering

ECE 498MH Signal and Image Analysis

FINAL PROJECT
Fall 2014

Assigned: Thursday, November 20, 2014 Due: Saturday, December 13, 2014

Reading:

For your final project, you should create a short movie (no shorter than 30 seconds, no longer than 10 minutes). The basic steps in this process are:

(a) Write a storyboard describing the story you want to tell.

(b) Create any animations and audio clips you desire (including pieces of labs, as listed below) in matlab, or in any other animation package of your choice.

(c) If you want to include live action segments, film yourself or your actor using any digital camera convenient to you (cell phone is fine).

(d) Combine the video segments using some type of video editing software, e.g., iMovie on a Macintosh, or VirtualDub on Windows. Once you have the video segments combined to your liking, splice in the audio segments.

Write a documentary paper describing your film. Your paper should specify the basic narrative story of your film (protagonist, antagonist, conflict, climax, and resolution). It should describe the sequence of video and audio effects in the film: say at what time each effect occurred, how it was made, and what it means. Finally, it should include at least one equation, describing the algorithm behind at least one of the video or audio effects.

Send me your movie and your documentary paper by e-mail, or using Box or Drive or the like, by midnight, Tuesday, December 4.

The film effects should include at least one variant of each of the seven labs we have done this semester:

(a) Lab 1: Natural speech (or any other periodic signal) resynthesized using a Fourier series (you can remove some harmonics for artistic effect if you wish).

(b) Lab 2: Synthetic speech (or musical sound) created using periodic repetition of damped sinusoids.

(c) Lab 3: Reverberation or echoes added to an audio signal using feedforward and/or feedback delays.

(d) Lab 4: Image filtered using an edge detection filter. For example, you could create an image sequence in which one image is successively more and more heavily filtered, or in which several seconds worth of video is created using filtered images.

(e) Lab 5: Audio signal filtered using a notch filter, to remove sound at some particular frequency. Alternatively, you might find it more interesting to filter using a bandpass filter, designed using firpm; for example, speech passed through a band of a few hundred Hertz centered around 1500Hz sounds a little like an old-fashioned radio.

(f) Lab 6: Image filtered using a lowpass filter.

(g) Lab 7: Video slowed down by upsampling in time.