Meeting Notes with Dr. Green

Monday 9-28-15

1:00-1:30

* Green stated that given our knowledge and background, complex algorithms would not be possible. We could probably extract the BPM of the song but that would even be a little complicated.
* He recommended we use MATLAB to at least play around and get an algorithm working before putting into code as it doesn’t compile and will be easier to visualize. Once we get it working in MATLAB, then go ahead and implement in C++.
* He went through the somewhat complex method of how to find the BPM of the song:
  1. Select an appropriate window of time. This should be equal to greater than 10 beat periods. The windows of time should be chosen so that when songs of many different BPM’s are run through the algorithm, at least 10 cycles are recorded.
  2. Select a segment of the song and do a Fourier Transform. Analyze the peaks.
  3. Set a threshold and examine the maximum peaks past the threshold. Note that the threshold can be a set value only if each song is at equal loudness. If this is not the case, then the threshold should be a ratio that corresponds to the loudness of the song in some way.
  4. Record the max peak of the FT at each segment of the song and develop some way of throwing out outlying data and finding a good average of the different values. (essentially, if you see one reoccurring value, it is likely the value you need)
  5. This process may not be very reliable on all songs
* Green also mentioned how the “shhhhh” sound is often very random and there is not good information that can be found from that. Vowels on the other hand offer good information. By examining the vowels of a female and male, one could tell the difference. This is because the frequency of say “oooo” would be lower in a man then in a woman. This is not always accurate as adolescent boys would sound more like women. I assume this would also make Celo Green be characterized as a woman.
* The general consensus of the meeting was that this is going to be a very difficult project given our lack of time and knowledge on the subject. So good luck to us.