DSP Spring 2009

Make-up Project Due: 06/29

[The Story]

You are requested to build a music equalizer to simulate the effect of a particular sound field/music style, such as in a concert hall, theatre or Rock&Roll, etc.

[Tasks]

1. Prepare one of your favorite songs (longer than 10 seconds) for MATLAB.
2. Define your 5-band equalizer (to fit a particular sound field/music style).
3. Implement your equalizer using **linear-phase** FIR filters (Note: check your overall magnitude response in frequency domain). Choose your own design methods and parameters for your filterbank.
4. Implement your equalizer using IIR filters.
5. Consider the overlap-add method to filter your favorite song (since it has long duration).
6. Use DFT/IDFT to implement the overlap-add method for FIR filter banks.
7. Demonstrate your results (including but not limited to 1. plotting the overall magnitude response; 2. plotting spectrograms of the song before/after passing through the filterbank; 3. playing the filtered song).
8. Discussions.

[Note]

1. Due time/venue：ED725/ED711 06/29 1:30~3:30 PM
2. Hand-in materials and demonstrations：
   (a) a written report (less than 5 pages);
   (b) MATLAB codes;
   (c) 10-minute demonstrations and Q&A.