ECE 285 Vocoder Project

The goal of this project is to develop a vocoder using simple all-pole models for speech (Chapter 9). The main data analysis blocks to be developed are: all-pole or LPC based vocal tract model, voiced/unvoiced detector, pitch frequency estimator. You should use the program for computing the all-pole model for speech from Hw 2. The remaining tasks to be carried out are as follows. (Use 20 ms segments)

1. Develop a voice activity detector. Use a two band approach. Verify its accuracy and modify it to fix obvious shortcomings.

2. Develop a voiced/unvoiced detector. Make sure to use at least two features for this detector. Debug and document the effectiveness of the voiced/unvoiced detector.

3. Develop a pitch estimation scheme. Debug and document the effectiveness of the pitch estimation scheme developed.

4. Develop a vocoder using the above building blocks. Debug and document the quality of the vocoder. Please provide a sample of the original and the vocoder reconstruction for listening. You can email me the files

Please prepare a report documenting your work. The project report is due in three weeks on Feb. 2nd. A preliminary report documenting your progress is due on Jan. 26th.

Some sources for speech files

http://spib.rice.edu/spib/select_noise.html

Another noisy speech database is from the following link:
http://www.utdallas.edu/~loizou/speech/noizeus/
This database includes 30 clean wavefiles (including both male and female speakers), and the noisy versions of these 30 sentences under various noisy conditions: Train noise, Babble noise, Car noise, Exhibition hall noise, Restaurant noise, Street noise. It also include different SNR level. This may be a good database for VAD design and testing.

http://cslu.cse.ogi.edu/nset/data/SpEAR_noisyspeech.html