ECE 584

Speech Processing
Winter 2014

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Office Hours: Thursday 5-6:00 PM
Monday and Tuesday 10-11 AM
And also by appointment

Prerequisite: ECE 580 or equivalent (digital signal processing)

Program Educational Objective of MSE program

Learning Goals of MS EE, CE and SWE program
http://www.engin.umd.umich.edu/ECE/grad_prog/general.php

Learning Goals assessed in this course:

ECE a) a strong background in theories and a good knowledge of the latest technologies in the electrical and computer engineering disciplines (tag: theory and knowledge)

ECE c) an ability to learn the latest research advancements, use advanced techniques and modern engineering tools in engineering practice, evaluate different strategies to derive a feasible solution

Course Overview:
1. Introduction
2. The human vocal system
3. Speech production
4. Classification of basic human speech sounds
5. Acoustics of the human vocal tract
6. Models of speech production
7. Analysis of speech signals
a. In the time domain (energy, zero crossings, autocorrelation, etc.)
b. In the frequency domain (short-time Fourier transform, bank of filters)
c. Linear prediction coding of speech

8. Speech processing applications:
   a. Speech synthesis
   b. Speech coding
   c. Speech recognition

9. Selected topics.

Textbook:

References:
2- J. L. Flanagan, "Speech analysis, synthesis and perception," Springer-Verlag,

Computer usage:
- Matlab and some of its toolboxes
- Programs used to record and process speech signals (e.g., Audacity,
  http://audacity.sourceforge.net/, GoldWave,

Grading system: Mid-term test 30%
Final examination 40%
Term project or paper 30%
Total 100%

Tests and exams are open book and notes. **Honor Code** must be strictly observed.

**Homework:** Solutions to the homework assignments will be available to students.