Polytechnic University of Puerto Rico
Department of Electrical Engineering
Master's Degree in Electrical Engineering

Course Syllabus

Course Title : Speech Processing

Course Code : EE 7730

Credits: : Three (3) Credits

Duration : One academic quarter

Schedule : Forty-five credit hours per course.

Pre-requisites: EE 6010: Mathematical Methods for Signal Processing
EE 6020: Stochastic Processes

Course Description

This course presents an overview of the area of speech processing using computers. The course includes topics such as the speech production process and the necessary mathematical background to study the major applications of the area. The applications presented in the course include speech coding, speech synthesis, speech recognition, and speaker and language identification.

Justification

Computer speech processing is one of the novel applications within the area of digital signal processing. Some of the most interesting applications in the area of speech processing currently include digital telephony, banking, security, and military applications. This course will cover all the introductory topics behind these applications along with a description of potential future applications in the area.

Objectives

Students will become familiar with the following topics in computer speech processing:

1. Description of the production and acoustic models of speech.

2. Development of speech analysis and recognition methods.

Textbook

Discrete Time Processing of Speech Signals (2000)
By Deller, J.R.
IEEE Press
ISBN: 0780353862

Topics Covered

1. Speech production and perception.
2. Speech signal processing techniques.
3. Speech coding and synthesis.
4. Speech recognition.
5. Additional applications: speaker, language recognition and multilingual systems.

Evaluation Criteria

Final grade will be determined based on the following scale:

100-90	A
89-80	B
79-70	C
69-60	D
59- 0	F

Course History

April, 2002; prepared by: Pedro A. Torres Ph.D. Candidate, P.E.
May, 2002; revised by Marvi Teixeira Ph.D., P.E.
March 30, 2004; revised by Kay Berkling, PhD

Bibliography

Spoken Language Processing (2001)
By X. Huang, A. Acero and H. Hon
Prentice Hall
ISBN: 0130226165

Discrete-time Speech Signal Processing (2001)
By T.F. Quatieri
Prentice Hall
ISBN: 013242942-X

Speech and Language Processing (2000)
By D. Jurafsky and J.H. Martin
Prentice Hall
ISBN: 0130950696

Speech Communications: Human and Machine (1999)
By D. O'Shaughnessy
John Wiley and Sons
ISBN: 0780334493

Statistical Methods for Speech Recognition (1998)
By F. Jelinek
MIT Press
ISBN: 0262100665

Fundamentals of Speech Recognition (1993)
By L.R. Rabiner and B. Juang
Prentice Hall
ISBN: 0130151572

Digital Processing of Speech Signals (1978)
By L.R. Rabiner and R.W. Schafer
Prentice Hall
ISBN: 0132136031