EQ2320 Speech Signal Processing 6.0 credits

Talsignalbehandling

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

For single course students: 120 credits and documented proficiency in English B or equivalent

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, students should be able to

* qualitatively describe the mechanisms of human speech production and how the articulation mode of different classes of speech sounds determines their acoustic characteristics,

* apply MatLab tools to analyse speech signals in the time and frequency domains, and in terms of the parameters of a source-filter production model,

* solve given problems regarding parameter estimation in source-filter production models and regarding speech analysis and synthesis using these models,

* describe and implement methods and systems for efficient quantization and coding of speech signals, and solve given problems regarding these methods,

* describe and implement methods for speech enhancement, and solve given problems regarding these methods,

* describe and implement simple pattern-recognition applications of speech processing, such as speaker and speech recognition, and solve given problems regarding these methods.

To achieve higher grades, students should also be able to

* solve more advanced given problems in all areas mentioned above.

Course contents

The course is about current speech signal processing technology and provides hands-on experience with the application of signal processing methods. The course includes topics in four main branches of audio speech processing:

* analysis-synthesis of speech,

* speech quantization, coding, and transmission,

* speech enhancement,

* acoustic speaker and/or speech recognition.

Course literature

Vary, P & Martin, R: Digital Speech Transmission. Enhancement, coding, and error concealment. Wiley, 2006.

Additional tutorial material.

See course homepage for current information.

Examination

- INL1 - Assignment, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Written examination (75%), home assignments (25%).

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.