Teaching

Graduate level

Professor Rolf Carlson
Director of graduate studies

Graduate students comprise about one third of the personnel at the department. Graduate studies towards the Doctor of Science degree require a minimum of four years after the M.Sc. graduation. Since most students are financed by research projects this time is generally exceeded.

The requirements include theoretical studies and a thesis. The thesis may be composed of a number of publications. The theoretical studies are individually tailored within the domain of graduate courses. Requirements include participation in research seminars and attending special lectures which supplement literature assignments. Credits are also given for certain undergraduate courses on top of the undergraduate requirements such as courses in linguistics and phonetics taken at Stockholm University. In addition to the teaching arranged by the staff at the department, special "bullet" courses are organised every year. At such an event a well-known researcher is invited to give a course during a limited period of time, typically a week. Several students at the department have participated in European Summer School and similar summer schools in Europe.

The graduate studies are organised according to two main programmes, with two subtopics each.

1. Speech and Music Communication

The Speech and Music Communication programme includes studies of human communication primarily with the help of acoustic signals such as speech and music. Communication with visual signals such as facial gestures during

speech production is also included. The programme contains descriptions, theories, models and applications covering all parts of the communication chain: production - acoustic transmission - perception - understanding or impression.

The programme has two subtopics**:** ***Speech Communication*** and ***Music Acoustics.***

2. Acoustic Signal Processing

The Acoustic Signal Processing programme covers theory and application in the field of acoustic signal processing, signal coding and information transmission, related to human sound production and signal processing by the human senses.

The programme has two subtopics***: Hearing Technology*** and ***Speech Signal Processing.***

Graduate School of Language Technology (GSLT) 2002

Starting the fall of 2001 the department is involved in the new national Graduate School of Language Technology (GSLT). It is one of 16 new national graduate schools funded by the Swedish government. It is hosted by Faculty of Arts, Göteborg University, and is a collaboration between leading centres in language technology in Sweden. Besides Göteborg University, the following partners are designated by the Swedish government: Högskolan i Borås, Högskolan i Skövde, Växjö University, Chalmers University of Technology, KTH (Royal Institute of Technology), Linköping University, Stockholm University, Lund University and Uppsala University. Further academic institutions may be added to the graduate school. Students may be placed at any of these institutions. The school aims to integrate research on speech and language and to provide a sound basis in both theoretical foundations and applications oriented research. It is committed to an international profile and welcomes applications from outside of Sweden. Five doctoral students from the department are directly involved and supported by this school.

Rolf Carlson represents KTH on the GSLT board.

GSLT: Speech Technology I (5 cr)

Teachers: Rolf Carlson, Björn Granström, David House and Mats Blomberg

The aim of this course is to give an overview of speech technology, some of the underlying theories and models and how these are integrated into applications, such as multimodal dialog systems. The course is aimed both at students with limited knowledge of the field, for whom it is compulsory within GSLT, and at students with a more extensive background in speech technology, who will be expected to take a more active part in the discussion of current research. In this way, the course is meant to contribute to the common platform for students with different backgrounds within GSLT, Graduate School of Language Technology.

The course is divided into 5 parts: Introductory lectures; Reading the listed material; Individual practical exercise; Preparing a term paper; and a Closing seminar including discussions, practical exercises and presentation of the term papers.

Bullet course: Three lectures on spoken language

Steven Greenberg, International Computer Science Institute, Berkeley, April 24-26, 2002

The three lectures will focussed on: What are the essential cues for understanding spoken language; Automatic phonetic and prosodic annotation of spoken language; Beyond the phoneme: A juncture-accent model of spoken language

Bullet course: The three lectures on speech recognition

Mehryar Mohri, AT&T Labs – Research, USA May 22-24, 2002

Mehryar Mohri short course focussed on the activities within speech at AT&T Labs - Research. The objective of the department is to design general mathematical frameworks, efficient algorithms, and fundamental software libraries for large-scale speech processing problems.. The three lectures included three topics: Weighted Automata Algorithms; Finite-State Machine Library (FSM Library); Speech Recognition Applications.

Teaching

Further Education Courses

2F4212 Acoustics for violin, guitar and piano technicians (4 cr)

16 students

Erik Jansson

The course was arranged for the guitarmaking school of Carl Malmsten Center of Wood Technology and Design, the school of violin makers and piano technicians at Dalarna University. The lectures consisted of a fundamental theoretical part on sound, hearing, resonators and room acoustics. In the applied instrument acoustics part the played string, the wood, the function and quality measures of pianos, guitars and violins were introduced. The course also included laboratory experiments on wood properties,plate tuning and the function of assembled instruments.

2F4215 The functioning of the singing voice (4 cr)

24 students

Johan Sundberg

The course was arranged again, this time in a four-weekends format. The lectures concerned physiologgy, breathing, voice source, formants/ articulation, proprioception, perception and hygiene. Participants spent about half of the course in workshops, where they analysed their own voice production by various real-time biofeedback devices, such as pletysmography for tracking breathing behaviour, inverse filtering for visualizing voice source etc.