



## DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

### **LT2216 Dialogue systems, 7.5 credits**

Dialogsystem, 7,5 högskolepoäng

*Second Cycle*

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#### **Confirmation**

This course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2018-05-29 and was last revised on 2018-06-19 to be valid from 2018-06-19, autumn semester of 2018.

*Field of education:* Science 100%

*Department:* Department of Philosophy, Linguistics and Theory of Science

#### **Position in the educational system**

The course can be part of the following programmes: 1) Applied Data Science Master's Programme (N2ADS) and 2) Master in Language Technology (One year or Two years) (H2MLT)

*Main field of studies*

Language Technology

*Specialization*

A1F, Second cycle, has second-cycle course/s as entry requirements

#### **Entry requirements**

Admission to the course requires either successful completion of both of the following courses:

- LT2001 Introduction to programming, 7.5 credits
- LT2002 Introduction to formal linguistics, 7.5 credits

or equivalent language technology skills.

## Learning outcomes

On successful completion of the course the student will be able to:

### Knowledge and understanding

- account for the limitations of contemporary components of speech synthesis and speech recognition, why the limitations are there, and what can be done to circumvent them,
- account for the most common strategies for dialogue management,
- account for the most important methodological principles for development of dialogue systems,
- give a brief account of the most important standards in the field,

### Skills and abilities

- do pen-and-paper design and testing of an idea for an implementation of a dialogue system,
- design SSML prompts for speech synthesis
- write SRGS grammars for speech recognition which effectively improve the ability to recognize an utterance,
- choose a suitable strategy for dialogue management for a given application and implement it in VoiceXML and/or SCXML,
- implement strategies for error handling, such as failed recognition,

### Judgement and approach

- make informed judgements of the theories and technologies that underlie the kinds of speech synthesis, speech recognition and dialogue managers that are discussed in the course- their merits and shortcomings.

## Course content

A *dialogue system* (or *conversational agent*) is a computer system that can have a dialogue with a human user. The dialogue is often speech-based and can sometimes use text, graphics, gestures, or other modalities to enhance the communication so it will be as efficient as possible. The latter case is said to be multi-modal dialogue systems.

A (pure) speech-based dialogue system can be said to consist of (at least) three modules: a module for the production of synthetic speech, a module for recognition of human speech, and a module for dialogue management. The lectures will treat the speech technology components as "black boxes" and spend most of the time on theories behind dialogue management and how to combine components to usable systems. To some

extent, these theories will also be connected to theories of human-human dialogue and to concepts such as dialogue structure, turn-taking and feedback.

The course lectures will also discuss important standards in the field, such as the W3C recommendations "Speech Recognition Grammar Specification" (SRGS), "Semantic Interpretation for Speech Recognition" (SISR), "Speech Synthesis Markup Language" (SSML) and "VoiceXML", and "State Chart XML" (SCXML). Time will also be spent on introducing good and proven methodology for design of dialogue systems.

But the course is primarily a laboratory course and participants are expected to spend much of the time experimenting (with teacher support) with speech synthesis and speech recognition and to actually design, implement and evaluate simple dialogue systems.

### **Form of teaching**

There are laboratory exercises that require attendance for a passing grade.

*Language of instruction:* English

### **Assessment**

The course is assessed through laboratory exercises, written assignments, a small project, a written exam and/or an oral examination. Compulsory attendance can apply for some course elements. A student who has failed a test twice has the right to change examiner, unless weighty argument can be adduced. The application shall be sent to the board of the department and has to be in writing. The total number of exam sessions is five, when feasible. Completion of examined student achievement is admitted.

### **Grades**

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

### **Course evaluation**

Students participating in, or having completed the course, are given the chance to anonymously submit their opinions and suggestions for the course in a course evaluation. A short version of the course evaluation, together with the reflections of the course coordinator, is published and made available to the students within a reasonable time after the course has finished. The next time the course will be given, a short version of the course evaluation will be presented together with any implemented measures.

