UNIVERSITY OF GOTHENBURG

DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

LT2926 Machine learning for statistical NLP: advanced, 7.5 credits

Maskininlärning för statistisk datalingvistik: avancerad, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2022-05-23 and was last revised on 2023-05-29 to be valid from 2023-08-28, autumn semester of 2023.

Field of education: Science 100%
Department: Department of Philosophy, Linguistics and Theory of Science

Position in the educational system

Main field of studies	*Specialization*
Language Technology	A1F, Second cycle, has second-cycle course/s as entry requirements

Entry requirements

Admission to the course requires a passed result in *each* of the following:

- programming, 7.5 hec, and
- machine learning, 7.5 hec, and
- introductory natural language processing or computational linguistics, 7.5 hec.

Equivalent skills can also result in admission to the course.

English 6 or equivalent is also required.

Learning outcomes

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

Knowledge and understanding

- account for the use of linguistic and multimodal data in developing custom NLP

applications.
- show awareness of advanced practices in machine learning, their connection to human cognition and learning and how they connect to current practices in NLP.
- show evidence of understanding the mathematical basis for recent machine-learning algorithms at a conceptual level.

Competence and skills
- create evaluation pipelines suitable for the NLP or multimodal application at hand.
- apply advanced and recent machine learning algorithms and approaches.
- design, develop, document, and distribute creative machine learning applications with recent toolkits and collaborative tools.
- perform work according to a predetermined schedule.

Judgement and approach
- compare and select appropriate machine learning and statistical approaches.
- justify design decisions and evaluation approaches in machine learning application development.
- observe and discuss ethical aspects of research and development.

Course content

This course will cover the following areas:

- Data representation for advanced language technology and multimodal tasks involving machine learning.
- Data pipeline design and advanced scientific practice in machine learning, and related ethical and professional issues.
- Data-intensive and "deep" approaches to learning in terms of approaches that are current in the rapidly changing scientific literature.
- Advanced approaches to neural networks and parameter update.
- Introduction to very recent techniques in the current scientific literature.

Form of teaching

Teaching will either take the form of distance education or on university premises in the form of lectures, exercises, lab work, and course projects. The course is to a great extent focused on lab work and projects.

Language of instruction: English
This course will be taught in English.

Assessment

This course will be assessed in terms of graded individual take-home assignments,

assessing practical mathematical and programming skills; a final project, including a software component, a presentation, and a report on the work, will be used to assess students' capacity for independent work. Students may also be asked to write in-class written tests or quizzes as part of the assessment.

Correcting teachers can request the completion of an examination.

A student who has taken two exams in a course or part of a course without obtaining a pass grade is entitled to the nomination of another examiner. The student needs to contact the department for a new examiner, preferably in writing, and this should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for special educational support, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, the examiner may decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years, after the course has ceased/been changed. The same applies to placements and professional placements (VFU), although this is restricted to just one additional examination session.

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 of 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 measures implemented.

Additional information

This course requires access to a computer with internet access.
This course cannot be used for degree credit alongside LT2306, LT2316, or LT2326.