



COURSE SYLLABUS

Maskininläring för strömmande data Machine Learning for Streaming Data 5 credits (5 högskolepoäng)

Course code: DV2594
Main field of study: Computer Science
Disciplinary domain: Technology
Education level: Second cycle
Specialization: AIN - Second cycle, has only first cycle course/s as entry requirements

Subject area: Computer Technology
Language of instruction: English
Applies from: 2020-08-31
Approved: 2020-04-27

1. Decision

This course is established by Dean 2019-11-21. The course syllabus is approved by Head of Department of Computer Science 2020-04-27 and applies from 2020-08-31.

2. Entry requirements

Admission to the course requires a Bachelor of Science in Computer Science, Computer Engineering, Electrical Engineering or similar area.

3. Objective and content

3.1 Objective

The purpose of this course is to give the student an introduction and hands-on approach to the field of machine learning for streaming data.

3.2 Content

The course comprises the following themes:

- Understanding and developing machine learning methods and theories including mathematical statistics, dimension reduction, feature/variable selection and visualization, decision trees and its applications, univariate and multivariate linear models, logistic regression, clustering methods, nearest neighbour classifiers, support vector machines, artificial neural networks, ensemble classifiers.
- Discussing application trends of using machine learning methods across industries and in different scientific research problems.
- Designing, implementing, and testing different machine learning algorithms.
- Evaluating machine learning methods using different measurement metrics.

4. Learning outcomes

The following learning outcomes are examined in the course:

4.1 Knowledge and understanding

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

- independently explain and summarize results from the application and evaluation of machine learning methods.

4.2 Competence and skills

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

- implement and apply machine learning methods to different streaming data problems.
- modify existing algorithms or develop new machine learning methods to be applied to different streaming data problems.

4.3 Judgement and approach

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

- plan and execute experiments to evaluate and compare machine learning methods.
- select the best machine learning algorithm by analyzing and evaluating performance of different methods.

5. Learning activities

The course will be online. The education comprises theory and practical parts. Thus, the course will provide theoretical and practical knowledge to analyze, implement, and evaluate machine learning systems. Moreover, two different assignments and one project will be given during the course and the knowledge is evaluated and increased through assignments and a project. The assignments and project must be conducted individually.

6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
2010	Written assignment 1	1 credits	GU
2020	Written assignment 2	1.5 credits	GU
2030	Project assignment	2.5 credits	GU

The course will be graded G Pass, UX Fail, supplementation required, U Fail.

The course-PM for each course revision should include the assessment criteria and make explicit in which modes of examination that the learning outcomes are assessed.

An examiner can, after consulting the Disability Advisor at BTH, decide on a customized examination form for a student with a long-term disability to be provided with an examination equivalent to one given to a student who is not disabled.

7. Course evaluation

The course evaluation should be carried out in line with BTH:s course evaluation template and process.

8. Restrictions regarding degree

The course can form part of a degree but not together with another course the content of which completely or partly corresponds with the contents of this course.

9. Course literature and other materials of instruction

Course notes will be posted periodically and presentations will be shared weekly on the course webpage.

Main Book: Machine Learning for Data Streams with Practical Examples in MOA

Authors: Albert Bifet, Ricard Gavaldà, Geoff Holmes and Bernhard Pfahringer

ISBN: 9780262037792

Publisher: The MIT Press

Year: 2018

Other teaching materials

Book: Machine Learning (The art and Science of Algorithms that Make Sense of Data)

Author: Peter Flach

ISBN: 978-1-107-09639-4

Publisher: Cambridge

Year: 2012