



HÖGSKOLAN I GÄVLE

Introduction to Machine Learning 7.5 cr

Introduktion till maskininlärning 7,5 hp

Set by Faculty of Engineering and Sustainable Development

Version

Set at

Valid from

2/2/23

HT2023

Level	G1F
Education level	First cycle
Course identifier	DVG337
Credits	7.5 cr
Main field of study	Computer Science
Subject group	Computer Technology
Disciplinary domain	Technology 100.0 %

Learning outcomes

After completion of the course the student shall be able to

1. explain the ideas, assumptions, and intuition behind the studied machine learning methods.
2. compare the strengths and weaknesses of the machine learning methods.
3. analyze relevant applications and determine suitable methods for them.
4. implement a machine learning method in relevant applications and evaluate its performance.
5. prepare data to facilitate machine learning.
6. recognize the effects of hyper-parameters as well as over-fitting and under-fitting.

Course content

Fundamental principles for machine learning

Overview of supervised learning methods such as k-nearest neighbors, logistic regression, neural networks, support vector machines, and classification trees

Overview of unsupervised learning methods such as k-means, DBSCAN and hierarchical clustering

Practical considerations in supervised and unsupervised learning such as cross-validation, hyper-parameter tuning, regularization, dimension reduction, and instance selection

Introduction to the concepts of reinforcement learning

Teaching

Lectures, assignments and project work

Prerequisites	Completed courses of at least 30 cr in Computer Science and Mathematics, including the courses Programming Methodology 7,5 cr and Linear Algebra 7,5 cr, or equivalent		
Examination	Written and oral presentations of assignments and project work		
	Moment 0010 Assignments 5 cr examines learning outcomes 1-6, grades Fail, Pass, Pass with distinction		
	Moment 0020 Project Work 2,5 cr examines learning outcomes 3-5, grades Fail, Pass, Pass with distinction		
Grade	A, B, C, D, E, Fx, F		
Other regulations	Grading criteria are provided by the course coordinator or examiner in connection with the course introduction		
Sustainable environment	A minor part of the course content deals with sustainable development.		
Module			
	0010 Assignments	5 cr	Grade: UV
	0020 Project work	2.5 cr	Grade: UV