

Module title		Abbreviation
Machine Learning		10-HCI-B-ML-242-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science IX		Institute of Human Computer Media
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
<p>The lecture module provides a broad introduction to machine learning, data mining, gesture processing, and statistical pattern recognition. Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Machine learning best practices (data preparation, bias/variance theory, hyperparameter search). To this end, numerous case studies and applications will be presented from gesture-based and multimodal interfaces, text and speech recognition (web search, anti-spam), intelligent robots (perception, control), machine vision, medical informatics, data mining, and other areas. In the exercise, students independently develop a machine learning algorithm from scratch in groups of 2-3 participants. They train and optimize their algorithm to recognize body gestures used to control a given application. Presentations, exercises and discussions help the student groups to familiarize themselves with the required technologies and activities and to organize the project as a whole.</p>		
<b>Intended learning outcomes</b>		
<p>After participating in the module courses, students are able to recognize basic application scenarios for machine learning methods. They remember subject-specific approaches and can apply them to different problems. They can summarize, compare and explain different approaches and evaluate their performance. They can apply available tools to typically occurring tasks and know their advantages and disadvantages. Furthermore, you can independently familiarize yourself with complex technical systems as well as independently develop problem-solving proposals, communicate these in a team and integrate them in a prototype.</p>		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
Module taught in: German and/or English		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) presentation of project results (approx. 30 minutes) or b) oral examination of one candidate each (approx. 30 minutes) Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
Teaching cycle: only in winter semester		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		

Bachelor's degree (1 major) Human-Computer-Interaction (2024)