

Module description: Machine Learning and Data Mining			
Module Code	t.BA.XX.MLDM.20HS		
ECTS Credits	4		
Language of Instruction/Examination	German		
Organizational Unit	CAI		
Module Coordinator	Alisa Rupenyan-Vasileva		
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.		
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 lab bi-weekly lessons per semester and half-class		
Module Description	Machine learning and data mining are essential components of successful data products and projects. Students are familiarized with the prerequisites for their use and with various methods for different applications. They study the theoretical fundamentals and the implementation of the methods.		
Module Content	<ul style="list-style-type: none"> The digitalization of processes and environments is difficult challenge for computer scientists. Software development is hereby not the primary problem, rather the professional processing and analysis of different datatypes and volumes. For this purpose it is essential to have a certain fundamental experience in the area of data analysis and the most important methods in the domain of machine learning. This module provides you a practical introduction in elemental data mining with methods of machine learning. The focus is on an good overall view and a clean methodology; proofs and details of the methods are not part of this course and are expected to be discussed in later course. The content of the lecture is applied practically by the participants in several projects. Accompanying Assignments: The lecture is accompanied by practical assignments containing of implementations in python and related tools and libraries with real-world datasets. 		
Prerequisite Knowledge	<ul style="list-style-type: none"> Programming 1&2: Reliable control of a higher procedural or object-oriented programming language Linear Algebra: Vector- and Matrix calculations, inverse Matrix, eigendecomposition Statistic and Stochastic: Fundamentals of probability calculation, distributions, correlations Algorithms and Data Structures: Algorithmic Thinking 		
Learning Objectives (Competences)	Students...	Competencies	Taxonomies
	You understand the fundamentals and specialities of Data-Analysis Projects, especially in contrast to Software development projects.	F, M	K1, K2
	You know methods for explorative Data Analysis, especially in the domain of Data Visualization and Feature Engineering. You are also able to successfully apply them in practice.	F, M	K1, K2, K3
	You know methods for knowledge extraction by machine learning applied to structured data. Additionally, you know the difference between machine learning applied to structured in contrast to unstructured data (e.g., images, sound).	F, M	K1, K2, K3
	You know perspectives and opportunities of current research and development in the domain of machine learning.	F	K1

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Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form
	written exam	Grade	90	80	acc. to module agreement
	Performance assessment during the semester				
	Bewertete Praktika und/oder Quizzes	Grade	0	20	acc. to module agreement
Classroom Attendance Requirement	None				
Learning material					
Comments	During the first week of the semester a written and communicated supplement can specify the module description in more detail.				