Valid from 2024.HS

Module description: Introduction to Natural Language Processing	
Module Code	t.BA.DS.NLP.20HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	CAI
Module Coordinator	Mark Cieliebak
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 2a 4 consecutive lecture lessons per semester week and class
Module Description	This module introduces the basic methods and technologies of Natural Language Processing (NLP). Typical tasks and solution approaches are presented and implemented based on practice-oriented projects.
Module Content	**Methods and technologies in the field of NLP are taught by means of three practice-oriented tasks covering typical topics such as clustering, text classification, and text generation (e.g., abstractive summarization). For each task, the relevant solution approaches are presented. These include, but are not limited to, the following topics: - Preprocessing of the data: Tokenization, stemming, etc. - Representation of the data: Vector-Space Models, TF-IDF, Pretrained Language Models/Embeddings etc. - Machine Learning Models and Algorithms: SVM, Neural Networks, etc. - Evaluation methods: Precision/Recall, F-Score, ROUGE etc. - Established tools and frameworks: e.g. nltk, Pytorch, huggingface etc. - Experimental setup and documentation of results For each task, students will develop a solution individually or in small groups of up to 3 people. The documentation of the solution will be assessed afterwards.**
Prerequisite Knowledge	
Learning Objectives (Competences)	

Students...	Competencies	Taxonomies
The students know typical tasks in the field of NLP.	F	K1, K2
Students can integrate existing technical solutions for a problem into their problem solving.	F, M	K1, K2, K3
Students can plan and document machine-based experiments on textual data in a structured way.	M	K1, K2, K3
The students can document their results in the form of a scientific report.	M	K1, K2, K3
The students work together actively and goal-oriented in a team and take responsibility for the development of the common project.	SE, SO, M	K1, K2, K3
Students can realize a larger and complex NLP project from vision to solution.	M, F	K1, K2, K3, K4, K5

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Performance Assessment	see tables below

End-of-module exam	Assessment	Length (min.)	Weighting	Form
report	Grade	0	60	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
report	Grade	0	20	acc. to module agreement
report	Grade	0	20	acc. to module agreement

Classroom Attendance Requirement	None
Learning material	• The necessary material is provided during in class.
Comments	Individual performance can also have an influence on individual grades in group work, i.e. not all group members must always receive the same grade.