### Module title
Deep Learning

### Abbreviation
10-I-DL-222-m01

### Module coordinator
Dean of Studies Informatik (Computer Science)

### Module offered by
Institute of Computer Science

### ECTS
5

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
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### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
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### Contents
The lecture provides advanced knowledge of deep learning techniques such as FCN, CNN and LSTMs, practical application examples for NN architectures, e.g. in the field of image and speech processing. Current models and methods of machine learning and their technical background are presented. Building on this, models from the field of deep learning, such as CNNs, RNNs and sequence-to-sequence architectures, are discussed. The theoretical foundations of these models, such as training through backpropagation, are also discussed in detail. For all the models covered, it is shown how they are used in practice for specific problems such as image processing and text generation.

### Intended learning outcomes
Students have knowledge of the possible applications and limitations of deep learning, of important architectures and how they are implemented in tools such as Tensorflow/Keras, of the ability to reprogram network structures from the literature, of data preparation and of solving concrete tasks.

### Courses
(V (2) + Ü (2))

### Method of assessment
written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

### Allocation of places
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### Additional information
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### Workload
150 h

### Teaching cycle
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)
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### Module appears in
- Bachelor’ degree (1 major) Mathematical Data Science (2022)
- Bachelor’ degree (1 major) Artificial Intelligence and Data Science (2022)
- Bachelor’ degree (1 major) Artificial Intelligence and Data Science (2023)
- Bachelor’ degree (1 major) Artificial Intelligence and Data Science (2024)