inf536 - Computational Intelligence II

<table>
<thead>
<tr>
<th>Module label</th>
<th>Computational Intelligence II</th>
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<tbody>
<tr>
<td>Module code</td>
<td>inf536</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Used in course of study</td>
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<td></td>
<td>Master's Programme Computing Science &gt; Angewandte Informatik</td>
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<tr>
<td></td>
<td>Master's Programme Engineering of Socio-Technical Systems &gt; Embedded Brain Computer Interaction</td>
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<td>Master's Programme Engineering of Socio-Technical Systems &gt; Human-Computer Interaction</td>
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<td></td>
<td>Master's Programme Environmental Modelling &gt; Mastermodule</td>
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Contact person

- Module responsibility
  - Oliver Kramer

Authorized examiners

- Die im Modul Lehrenden
  - Oliver Kramer

Entry requirements

Skills to be acquired in this module

Professional competence

The students:

- Recognise machine learning problems
- Implement simple algorithms of machine learning
- Critically discuss solutions and selection of methods
- Deepen previous knowledge of analysis and linear algebra

Methodological competence

The students:

- Deepen programming skills
- Apply modelling skills
- Learn about the relation between problem class and method selection

Social competence

The students:

- Cooperatively implement content introduced in lecture
- Evaluate own solutions and compare them with those of their peers

Self-competence

The students:

- Evaluate own skills w.r.t. peers
- Realise personal limitations
- Adapt own problem solving approaches w.r.t. required method competences

Module contents

Computational Intelligence comprises intelligent and adaptive methods for optimisation and learning. The module “Computational Intelligence II” concentrates on methods for machine learning and data mining. The exercises introduce and deepen practical aspects of the implementation and algorithmic design, also taking into account application aspects.

Overview of Content:

- Foundations of learning and classification
- Nearest neighbouring methods
- Model selection and parameter tuning
- Regression
- Support vector and kernel methods
- Clustering
- Dimensionality reduction

**Reader's advisory**

- HASTIE, T., TIBSHIRANI, R., FRIEDMAN, J.H.: The Elements of Statistical Learning, Springer 2009

**Links**

- Languages of instruction: German, English
- Duration (semesters): 1 Semester
- Module frequency: once a year
- Module capacity: unlimited
- Module level: AS (Akzentsetzung / Accentuation)
- Modulart: Pflicht o. Wahlpflicht / compulsory or optional
- Lern-/Lehrform / Type of program: V+Ü
- Vorkenntnisse / Previous knowledge:
  - inf535 Computational Intelligence I
  - Statistics

**Examination**

- Final exam of module: At the end of the semester
- Type of examination: Written or oral exam

**Course type**

- Lecture: 2.00 SWS, SuSe, Frequency: 28 h
- Exercises: 2.00 SWS, SuSe, Frequency: 28 h

**Total time of attendance for the module:** 56 h