Lehrform (teaching format) / SWS (hours per week): 4K

Kreditpunkte (credit points): 6

Turnus (frequency): usually, each winter term

Inhaltliche Voraussetzungen (content-related prior knowledge/skills): none

Sprache (language): English

Lehrende (teaching staff): AG Cognitive Systems Lab (Dr. Felix Putze)

<table>
<thead>
<tr>
<th>Studiengang (degree program)</th>
<th>Module</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informatik (Master)</td>
<td>IMVA, IMVA-AI</td>
<td>ab 1.Sem.</td>
</tr>
<tr>
<td>AI and Intelligent Systems (Master)</td>
<td>AI-M-MLCS</td>
<td>from 2nd sem.</td>
</tr>
<tr>
<td>Management Information Systems (Master)</td>
<td>(MIS-INF3)</td>
<td>from 2nd sem.</td>
</tr>
<tr>
<td>Informatik (Bachelor)</td>
<td>(nur Freie Wahl)</td>
<td></td>
</tr>
</tbody>
</table>

Lernergebnisse / Learning Outcome:

- Students are able to conduct machine learning experiments following good scientific practices
- Students are able to perform and document machine learning experiments in a reproducible way
- Students are able to evaluate and incorporate new tools into their machine learning research pipeline
- Students are able to present, evaluate, and discuss their machine learning experiments in a scientific paper

Inhalte / Contents:

Students will learn the theory and practice of empirical machine learning research. Iteratively, they will construct a research pipeline for a common machine learning task, which they will document and evaluate in the form of a scientific paper. Aspects of the research pipeline which the course will cover:

- Uncertainty quantification
- Statistical analysis
- Bias estimation
- Parameter optimization
- Energy consumption measurement
- Documentation of code and data
- Visualization

Good practical and theoretical knowledge of state-of-the-art machine learning methods is strongly recommended.

Hinweise (remarks): The table lists only the primary / most specific modules to which this course is assigned.