Lehrform (teaching format) / SWS (hours per week): 2 VL + 2 UE

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 Software Engineering für Kognitive Robotik und Systeme (Prof. Dr. Nico Hochgeschwender)

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

Lernergebnisse / Learning Outcome:

- To be able to communicate in the terminology of the field of robot software engineering and classify components, methods and tools using this terminology.
- To be able to critically reflect on relevant standards and norms in the field of cognitive robotics.
- To be able to identify and formulate requirements for cognitive robots.
- To be able to identify and decompose cognitive functions and to specify robust, cognitive robot control architectures.
- To be able to specify and execute testing and evaluation campaigns of cognitive robots.

Inhalte / Contents:

- Cognitive robots and desirable characteristics
- Software engineering challenges related to cognitive robots (e.g., safety, robustness, adaptability)
- Relevant standards and norms in the field of cognitive robots and their limitations (e.g., safety standards)
- Component-based cognitive robot software architectures (e.g., ROS 2)
- Monitoring (e.g., execution and safety monitoring, meta-cognition)
- Behaviour specifications (e.g., behaviour trees)
- Benchmarking and performance evaluation (e.g., metrics and evaluation protocols)
- Evolving non-functional requirements for cognitive robots (e.g., transparency, explainability)

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