| Module title | | | Abbreviation |
|---|---|---|---|
| **Deep Reinforcement Learning for Optimal Control** | | | 10-I=DRLOC-252-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 5 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | graduate | -- | |

**Contents**

- Key Concepts in Reinforcement Learning
- Exact Methods for Finite Markov Decision Processes
- Tabular Reinforcement Learning
- Planning and Learning with Tabular Methods
- Approximation Methods and Deep Reinforcement Learning
- Policy Optimization
- Value-Based Methods
- Applying Reinforcement Learning and Practical Tips and Tricks
- Aerospace Applications
- Model-Based Reinforcement Learning
- Challenges
- Frontiers and Future of Deep Reinforcement Learning

**Intended learning outcomes**

Students understand the basics of reinforcement learning & deep reinforcement learning (model-free & model-based). They understand current challenges and unsolved problems. They are able to use standard algorithms for (continuous) control tasks and have learned about aerospace applications.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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).
Language of assessment: English
creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): IN

**Workload**

150 h

**Teaching cycle**

Teaching cycle: every year, summer semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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**Module appears in**

Master's degree (1 major) Computer Science (2025)