Modulhandbuch

Embedded Systems and Microrobotics - Master's Programme

im Sommersemester 2021

erstellt am 07/08/24
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Frühere Module

inf191 - Special Topics in Practical Computer Science II

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Verwendbarkeit des Moduls
- Master's Programme Computing Science (Master) > Praktische Informatik

Zuständige Personen
- Peter, Andreas (module responsibility)
- Vogel-Sonnenschein, Ute (module responsibility)
- Lehrenden, Die im Modul (Prüfungsberechtigt)

Prerequisites
No participant requirements

Skills to be acquired in this module

The module aims to integrate current developments in the field of Practical Informatics into the course of study in the appropriate course forms.

**Subject competences**
The students:
- differentiate and contrast a subarea of practical computer science in more detail
- recognize and assess the techniques and methods to be applied in the special field of the course and their limits
- identify, structure and solve problems also in new or emerging areas of their discipline
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in practical computer science and assess their significance
- critically follow further developments in the special field discussed in the course.

**Methodological competencies**
The Students:
- apply state-of-the-art and innovative methods in the research and solution of problems, drawing on other disciplines where appropriate
- investigate problems on the basis of technical and scientific literature
- write an article according to scientific criteria, and present their results in a scientific talk
- reflect on problems, including those in new or emerging areas of practical computer science, and apply computer science methods to investigate and solve them
- plan time schedules and other resources
- develop and reflect on their own theories on independently generated hypotheses

**Social Skills**
The Students:
- will communicate persuasively orally and in writing with users and professionals
- will solve tasks goal-oriented in a team

**Self-competencies**
The students:
- deepen their self-organization skills
- reflect self-critically on their actions and skills in the special field under consideration and assess them appropriately
Module contents

In this module, content and methods on current topics in practical computer science are taught.

For details on objectives and contents, please refer to the details of the assigned course or contact the lecturers directly.

Literaturempfehlungen

depending on the course assigned

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Form of instruction

VA-Auswahl

SWS

2

Frequency

siehe Angebotsrhythmus Modul

Workload Präsenzeit

56 h
inf493 - Special Topics in Theoretical Computer Science II

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Prerequisites

The required prerequisites are specified in the details of the assigned course.

Skills to be acquired in this module

The aim of the module is to integrate current developments in theoretical computer science into the degree program in appropriate course formats.

Professional skills

The students:

- differentiate and contrast a sub-area of computer science in which they have specialized in more detail or reflect on computer science in general
- recognize and assess the techniques and methods to be used in their special field and their limitations
- identify, structure and solve problems in new or emerging areas of their discipline
- apply state-of-the-art and innovative methods to investigate and solve problems, drawing on other disciplines where appropriate
- recognize the limits of today's knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in computer science and assess their significance

Methodological skills

The students:

- evaluate tools, technologies and methods and apply them in a differentiated manner
- creatively develop new and original approaches and methods
- reflect on problems in new or emerging areas of their discipline and apply computer science methods to investigate and solve them

Social skills

The students:

- integrate their skills into team processes

Personal skills

The students:

- pursue the further developments in computer science in general and in their specialized field successfully and independently carry out innovative activities in their professional field

Module contents

Depending on the assigned course

Literaturempfehlungen

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inf592 - Special Topics in 'Applied Artificial Intelligence' II

Module label: Special Topics in 'Applied Artificial Intelligence' II

Modulkürzel: inf592

Credit points: 6.0 KP

Workload: 180 h

Verwendbarkeit des Moduls: Master's Programme Computing Science (Master) > Angewandte Informatik

Zuständige Personen:
- Sonntag, Daniel (module responsibility)
- Lehrenden, Die im Modul (Prüfungsberechtigt)

Prerequisites: No participant requirement

Skills to be acquired in this module

The module aims to integrate current developments in the specialization area ‘Learning and Cognitive Systems II’ into the appropriate course formats within the study program.

Professional competences

The students:
- differentiate and contrast a specific area of computer science in which they have specialized, in more detail, or reflect on computer science in general
- recognize and assess the techniques and methods applicable in their specialized field and their limitations
- identify, structure and solve problems also in new or emerging areas of their discipline
- apply state-of-the-art and innovative methods in investigating and solving problems, possibly drawing from other disciplines
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in computer science and assess their significance

Methodological competencies

The students:
- valuate tools, technologies, and methods and apply them in a differentiated manner, creatively developing new and original approaches and methods
- reflect on problems, even in emerging areas of their discipline, and apply computer science methods to investigate and solve them

Social Competencies

The students:
- integrate their skills into team processes

Self-competences

The students:
- critically follow the further developments in computer science in general and in their specialized area
- successfully and independently carry out innovative activities in their professional field

Module contents

This module offers various classes in the field of Learning and Cognitive Systems. For details regarding objectives and content, please refer to the specific class or contact the instructor directly.

Literaturempfehlungen

depending on the area of specialization and the assigned course
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| Workload Präsenzzeit | 56 h |
inf492 - Special Topics in Theoretical Computer Science I

**Module label**
Special Topics in Theoretical Computer Science I

**Modulkürzel**
inf492

**Credit points**
6.0 KP

**Workload**
180 h

**Verwendbarkeit des Moduls**
- Master's Programme Computing Science (Master) > Theoretische Informatik

**Zuständige Personen**
- Wehrheim, Heike (module responsibility)
- Lehrenden, Die im Modul (Prüfungsberechtigt)

**Prerequisites**
The required prerequisites are specified in the details of the assigned course.

**Skills to be acquired in this module**
The module aims to integrate current developments in the specialization area "Modeling and Analysis of Complex Systems" I into the course of study in the appropriate course forms.

**Professional competencies**
The students
- differentiate and contrast a subarea of computer science in which they have specialized in more detail or reflect on computer science in general
- recognize and evaluate the techniques and methods to be applied in their special field and their limitations
- identify, structure and solve problems also in new or emerging areas of their discipline
- apply state-of-the-art and innovative methods in investigating and solving problems, drawing on other disciplines as appropriate
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in computer science and assess their significance

**Methodological competencies**
The students
- evaluate tools, technologies and methods and apply them in a differentiated manner
- creatively develop new and original approaches and methods
- reflect on problems also in new or emerging areas of their discipline and apply computer science methods for investigation and solution

**Social Competencies**
The students
- integrate their skills into team processes

**Self-competencies**
The students
- critically follow further developments in computer science in general and in their field of specialization
- carry out innovative activities in their professional field successfully and independently

**Module contents**
Depending on the assigned course

**Literaturempfehlungen**
Will be announced in the course
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inf189 - Special Topics in Practical Computer Science I

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<td>• Vogel-Sonnenschein, Ute (module responsibility)</td>
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Skills to be acquired in this module

The module aims to integrate current developments in the field of Practical Informatics into the course of study in the appropriate course forms.

**Professional competences**

The students:

- differentiate and contrast a subarea of practical computer science in more detail
- recognize and assess the techniques and methods to be applied in the special field of the course and their limits
- identify, structure and solve problems also in new or emerging areas of their discipline
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in practical computer science and assess their significance
- critically follow further developments in the special field discussed in the course.

**Methodological competences**

Students will:

- apply state-of-the-art and innovative methods in the reserach and solution of problems, drawing on other disciplines where appropriate
- investigate problems on the basis of technical and scientific literature,
- write an article according to scientific criteria, and present their results in a scientific talk
- reflect on problems, including those in new or emerging areas of practical computer science, and apply computer science methods to investigate and solve them
- plan time schedules and other resources
- develop and reflect on their own theories on independently generated hypotheses

**Social competences**

Students will:

- communicate persuasively orally and in writing with users and professionals
- solve tasks goal-oriented in a team

**Self competences**

The students

- deepen their self-organization skills
- reflect self-critically on their actions and skills in the special field under consideration and assess them appropriately

Module contents
In this module, content and methods on current topics in practical computer science are taught.

For details on objectives and contents, please refer to the details of the assigned course or contact the lecturers directly.

**Literaturempfehlungen**

depending on the course assigned

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**Reference text**

see course description for more details

**Teaching/Learning method**

events from V, S, Ü, P

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Portfolio and presentation (Referat) : during the course
Written or oral exam: At the end of the lecture period.

More detailed information on the forms of examination will be given in the course.

**Form of instruction**

VA-Auswahl

**SWS**

4

**Frequency**

siehe Angebotsrhythmus Modul

**Workload Präsenzzeit**

56 h
inf593 - Special Topics in 'Applied Artificial Intelligence' I

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Verwendbarkeit des Moduls
- Master's Programme Computing Science (Master) > Angewandte Informatik

Zuständige Personen
- Sonntag, Daniel (module responsibility)
- Lehrenden, Die im Modul (Module counselling)

Prerequisites
No participant requirement

Skills to be acquired in this module

This module aims to integrate current developments in the specialization area "Learning and Cognitive Systems" I into the course of study in the appropriate course forms.

Professional competences
The students:
- differentiate and contrast a specific area of computer science in which they have specialized, in more detail, or reflect on computer science in general
- recognize and assess the techniques and methods applicable in their specialized field and their limitations
- identify, structure and solve problems also in new or emerging areas of their discipline
- apply state-of-the-art and innovative methods in investigating and solving problems, possibly drawing from other disciplines
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in computer science and assess their significance

Methodological competencies
The students:
- valuate tools, technologies, and methods and apply them in a differentiated manner, creatively developing new and original approaches and methods
- reflect on problems, even in emerging areas of their discipline, and apply computer science methods to investigate and solve them

Social Competencies
The students:
- integrate their skills into team processes

Self-competences
The students:
- critically follow the further developments in computer science in general and in their specialized area
- successfully and independently carry out innovative activities in their professional field

Module contents

depending on the area of specialization and the assigned course

Literaturempfehlungen

depending on the area of specialization and the assigned course
## Links

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inf581 - Special Topics in 'Digitalised Energy Systems' II

Module label
Special Topics in 'Digitalised Energy Systems' II

Modulkürzel
inf581

Credit points
6.0 KP

Workload
180 h

Verwendbarkeit des Moduls
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's programme Digitalised Energy Systems (Master) > Digitalised Energy System Automation, Control and Optimisation

Zuständige Personen
- Nieße, Astrid (module responsibility)
- Lehrenden, Die im Modul (Prüfungsberechtigt)

Prerequisites
No participant requirements

Skills to be acquired in this module

This module integrates current developments in the field of Digitalised Energy Systems in adequate study courses.

Professional competences
The students:

- define and contrast a computer science part, in which they are specialised, in detail or
- evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

Methodological competences
The Students:

- evaluate tools, technologies and methods
- sophisticatedly combine new and original approaches and methods
- creatively evaluate problems/tasks, including new or developing subject areas of their discipline
- apply computer science methods for solutions and research

Social competences
The Students:

- support team process by their abilities

Self-competences
The Students:

- pursue the overall and special computer science development
- critically implement innovative professional activities effectively and independently

Module contents
See assigned course description

Literatureempfehlungen
Will be announced in the course

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**Präsenzzzeit Modul insgesamt**  56 h