| Modulbezeichnung: | Research Project Minor (ASC-RP-MINOR)<br>(Research Project Minor) | 10 ECTS |
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| Modulverantwortliche/r: | Emanuël A. P. Habets, Meinard Müller | |
| Lehrende: | N.N | |

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| Startsemester: SS 2018 | Dauer: 1 semester | Turnus: jährlich (WS) |
| Präsenzzeit: k.A. Std. | Eigenstudium: k.A. Std. | Sprache: Englisch |

**Lehrveranstaltungen:**

In Absprache mit der Mentorin/mit dem Mentor

**Inhalt:**

This module is intended to develop the skills needed for independent scientific practice, through in-depth work within a topic such as audio processing, video coding, wireless communications, molecular communication, system design and implementation, machine learning, game theory, information theory, communication networks, or embedded systems. (Note that the topics for the Minor Research Project Module must be different from the topic for the Major Research Project Module.) Students first agree on a topic with their mentor and then define particular project aspects with an advisor from the appropriate field. A project typically includes attending relevant lectures (especially from the elective module catalog), internships, seminars, working with scientific literature ("directed reading"), evaluating algorithms, and designing hardware implementations. Cooperation with international research partners, potentially leading to a stay abroad, is strongly encouraged. Students must complete a final report for this module, aiming towards a conference publication.

The Minor Research Project Module bridges the gap between theoretical foundations and technical implementations. Students pursue their individual interests by consulting with their mentor and choosing optional mandatory elective modules and technical elective modules, allowing an application-specific immersion. By more advanced lectures and one-on-one directed reading courses, students deepen their knowledge of communications and multimedia technology. This project gives an interdisciplinary character to the ASC study programme.

The Minor Research Project Module implements innovative learning and teaching practices - a key element is continuous contact between students and faculty. In directed reading courses, a small group of students studies and exchanges views on current scientific literature, supported by faculty. Faculty members also introduce students to scientific practice early on through scientific projects. Summer/winter schools and soft skills courses complement the scientific coursework and provide key skills.

**Lernziele und Kompetenzen:**

Domain-Specific Knowledge

Students have a solid theoretical background in communications and multimedia technology. Students develop a deep understanding of digital techniques for information acquisition, processing, analysis and transmission. In this context, students compare and contrast various methods and techniques by analyzing and evaluating them. Furthermore, students apply theoretical knowledge by implementing and testing concrete applications of social relevance. The elements above develop the skills needed to transfer knowledge from theory into practice.

Learning and Methodological Skills

The students apply specific signal processing techniques. They are able to communicate their results in a scientifically appropriate manner. They are capable of writing scientific texts independently and in a limited amount of time. Students recognize connections and inter-relations within a topic and are able to associate them with specific problem formulations.

Personal Skills Students are conscious of the strengths they can contribute to a project and the weaknesses that they must address through specific measures. Students expand their understanding of a topic by implementing algorithms and procedures, and testing them within concrete application scenarios. Students discuss their findings and challenges with faculty. Students have a solid command of independent scientific practice.

Interpersonal Skills

Students communicate and discuss ideas in an intercultural context, in the style that is prevalent for scientific conferences and workshops. They can present and explain complex ideas in an easily comprehensible manner.

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**Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:**

Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:

[1] **Advanced Signal Processing & Communications Engineering (Master of Science)**
(Po-Vers. 2016w | TechFak | Advanced Signal Processing & Communications Engineering (Master of Science) | Masterprüfung | Pflichtmodule | Research Project (Minor))

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**Studien-/Prüfungsleistungen:**

Portfolio Research Project (Minor)
Prüfungsleistung, mehrteilige Prüfung

Erstablegung: SS 2018, 1. Wdh.: WS 2018/2019
1. Prüfer: Emanuël A. P. Habets, 2. Prüfer: Meinard Müller

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