Computer Science

/Datalogi/ SCB-code: 10201

1 General description of the research area

The PhD studies area of Computer Science extends over various topics from the fundamental studies of algorithms, computational processes and knowledge representation, methodologies for the design of complex systems in which software is of central importance, and complex distributed computer systems to the study of information systems and natural language processing.

The foundation of the area includes symbolic languages such as programming-, specification,- and modelling languages together with methods for (1) the design of complex software systems, system architectures, and systems for data- and knowledge processing and (2) the analysis of the properties of such systems. Important research areas deal with software systems that continuously interact with their environment such as operating systems, embedded systems, cyber-physical systems, real-time systems, and autonomous intelligent systems.

2 Eligibility requirements and selection

The basic eligibility requirements as well as the general principles for selection are specified in the faculty's *Study Handbook for PhD Studies*.

2.1 Specific eligibility requirements

Admission to PhD Studies in the research area of Computer Science requires either a master's degree in the field of the research area or completion of courses of at least 60 ECTS in the field of the research area, including an independent project of at least 15 ECTS. Out of these 60 ECTS, at least 30 ECTS should be at the master's level.

3 Degree

PhD studies in Computer Science lead to a Degree of Doctor or a Degree of Licentiate. The latter degree can also serve as a stage in the PhD studies. The Degree of Licentiate comprises 120 ECTS, of which the licentiate thesis corresponds to 60-80 ECTS, and courses of 40-60 ECTS of which at least 30 ECTS must be at PhD level. The Degree of Doctor comprises 240 ECTS, of which the doctoral thesis corresponds to 150-180 ECTS, and courses of 60-90 ECTS, of which at least 45 ECTS must be at PHD level. The distribution between the course credits and the thesis credits is regulated in the first individual study plan that is established.

4 Goals and implementation of the PhD studies

The general goals and objectives of PhD studies are specified in the introduction to the faculty's *Study Handbook for PhD Studies*, as well as in the Higher Education Ordinance (reprinted in the *Study Handbook*'s appendix A).

PhD studies in Computer Science aim to deepen the PhD student's knowledge in the research area and, through research supervision, to prepare the PhD student to make contributions in research and development. The PhD studies will provide in-depth knowledge of the research area, thorough training in research methodology and good insight into problems that arise in applications and research issues.

The outcome of PhD studies is to ensure that the PhD student develops the ability to critically and independently plan, lead, carry out and publish research and development projects. The PhD studies should also be tailored to a future profession in the field of computer science. PhD studies in Computer Science will equip the PhD student with the knowledge and skills necessary to fulfill all the required degree outcomes. The choice and span of courses in the studies are dependent upon the PhD student's prior knowledge and determined by the supervisor. The studies should include basic courses that give the PhD student broad knowledge and understanding of the field of computer science and adjacent, related fields, as well as in-depth courses within the thesis' research area and adjacent, related fields. The PhD student will develop familiarity with scientific methodology through his/her own research and by attending a mandatory course in research methodology.

Instruction within the framework of the PhD studies is given in the form of lectures, seminars, group supervision and individual supervision. During his/her period of study, the PhD student should take part in the department's research activities by attending seminars and guest lectures. This provides valuable and important skills and abilities which often cannot be acquired by another way. After starting to work on his/her thesis, the PhD student should, at least once every semester, report on the results achieved and plans for continued work in a seminar or similar setting. The PhD student should participate in national as well as international conferences and present his/her own research.

The PhD student should conduct research in parallel with course studies. The PhD student should consult with his/her supervisor regarding the research on a continuous basis. In order to receive a Degree of Doctor or a Degree of Licentiate, the student should submit his/her research results in the form of a thesis, which can be presented either as a continuous piece of work or as a compilation of essays. A doctoral thesis should demonstrate intellectual autonomy and be at such level that it can be judged to meet the requirements to be accepted for publication in an international scientific journal of good quality.

The studies provide the PhD student with an in-depth insight into the possibility of science to contribute to sustainable social development. This is achieved by the faculty common course requirements, as well as through participation in ongoing discussions, such as research seminars, and reflecting on the sustainability aspects of their own research work.

4.1   Thesis

The overall rules regarding the format, submission and grading of a thesis can be found in the faculty's *Study Handbook for PhD Studies*.

4.2   Individual study plan

An individual study plan will be formulated for each PhD student. The detailed planning of courses and other components will be conducted in consultation with the supervisor and documented in the individual study plan (see *Study Handbook for PhD Studies*, section 5.3). The study plan should be established within one month after admission to PhD studies, and it should be revised at least once a year.

4.3   Supervision

The general regulations for supervision can be found in the *Study Handbook for PhD Studies*, section 4, and in the faculty's policy for supervision of PhD studies.

4.4   Courses

4.4.1   Faculty course requirements

Scientific theory, methodology, ethics, gender equality and sustainability
All PhD students admitted should complete mandatory courses as decided by the faculty in Scientific theory, methodology, ethics, gender equality and sustainability, or be deemed to have equivalent competencies, in order to receive a degree.

Pedagogic studies
All PhD students who teach should complete a basic course in pedagogy. At least 3 ECTS from this course should be included in the PhD studies, and any remaining credits should be counted as departmental duties (see *Study Handbook for PhD Studies*, section 5.5).

4.5   Accreditation

Accreditation of course credits is regulated by the *Study Handbook for PhD studies*, section 5.6.

5   Other information

5.1   Transitional provisions

Changes to the general study syllabus do not apply to those who have already been admitted to PhD studies in the research area. A change to the new general study syllabus may however be approved if both the main supervisor and the PhD student agree. In such a case, this should be documented in the individual study plan.

6   Commencement

The General study plan comes into force 1st of July 2023.