UNIVERSITY OF GOTHENBURG

IT FACULTY

Human-centered Artificial Intelligence Master's Programme, 120 credits

Human-centered Artificial Intelligence masterprogram, 120 högskolepoäng

Programme code: T2HAI

Second cycle / Avancerad nivå

1. Confirmation

This programme syllabus was confirmed by the IT Faculty Board on 12-09-2022 (GU 2022/1389) to be valid from 28-08-2023, Autumn semester 2023.

Responsible Department/equivalent: Department of Applied Information Technology

2. Purpose

Artificial intelligence (AI) creates completely new conditions for business, public sector, private individuals, and society at large. AI means both new opportunities and challenges for the transformation of society in all aspects. Existing structures and business models are being challenged and fundamentally changed. Global societal challenges regarding sustainability and society's sustainable transition are affected. The difference between interaction with humans and with AI is increasingly blurred, as personal responses become digital interactions with artificially intelligent agents. In order to responsibly realize the potential of AI for the ongoing transformation of society, there is need for knowledge of AI in relation to society, in all sectors of society.

The overall purpose of the programme is to provide students with an in-depth understanding of how AI is transforming society and the ability to take leading roles in this transformation. The programme provides students with a broad theoretical foundation for understanding problems, methods and techniques for analyzing the implications of AI, as well as practical skills for managing AI-driven change in complex environments. Central to the programme is to be close to the research front in the areas included in the programme, and to work closely with industry, the public sector and civil society.

The programme's pedagogy is based on creating a student-centered learning environment that encourages participation. The education programme strives for a mixed student group and therefore welcomes students with a bachelor's degree from a number of different fields, including cognitive science, computer science, media studies, information technology, economics,

industrial economics and behavioral science.

The programme prepares students for professional roles that arise as AI permeates society to a greater extent, for example AI strategists, UX designers with specialization in AI, AI Ethics Specialist. The programme also prepares students for further studies within the university.

3. Entry requirements

Bachelor's degree 180 credits including an independent project (degree project) of at least 15 credits or equivalent.

7.5 credits programming in a general programming language, 7.5 credits in artificial intelligence or machine learning, and 7.5 credits in human-computer interaction or human-technology interaction.

Applicants must prove their knowledge of English: English 6/English B from Swedish Upper Secondary School or the equivalent level of an internationally recognized test, for example TOEFL, IELTS.

Specific entry requirements for admission to a course within the study programme

Within the study programme there can be specific entry requirements for admission to individual courses. These specific entry requirements are documented in each course syllabus and state which entry requirements are necessary to be registered on a course within the study programme.

Selection

Selection is according to the Higher Education Ordinance and the University of Gothenburg admission regulations for education on first and second cycle.

4. Higher education qualification and main field of study

This programme leads to a Degree of Master of Science (120 credits) with a major in Applied Information Technology (Filosofie masterexamen med huvudområdet Tillämpad informationsteknologi).

5. Outcomes

General outcomes for Degree of Master (120 credits)

Knowledge and understanding

For a Degree of Master (120 credits) the student shall

- demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

Competence and skills

For a Degree of Master (120 credits) the student shall

- demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information
- demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work
- demonstrate the ability in speech and writing both nationally and internationally to clearly report and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and approach

For a Degree of Master (120 credits) the student shall

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Local outcomes

Knowledge and understanding

For a Degree of Master of Science (120 credits) with a major in Applied Information Technology the student shall

- show in-depth knowledge of and the ability to apply theories related to artificial intelligence in the areas of behavioral science, human-computer interaction, communication, informatics, and ethics, and
- show ability to identify current challenges in research, relevant for empirical studies in the main field of study.

Competence and skills

For a Degree of Master of Science (120 credits) with a major in Applied Information Technology the student shall

- demonstrate ability to plan for the integration of AI in various social and organisational contexts,
- demonstrate ability to design and evaluate human-centered AI implementations.

Judgement and approach

For a Degree of Master of Science (120 credits) with a major in Applied Information Technology the student shall

- demonstrate ability to critically evaluate assumptions, principles, strengths and weaknesses of central theories and frameworks in human-centered AI,
- demonstrate ability to compare and contrast AI innovation and application,
- demonstrate ability to assess and argue for choices and combinations of methods for organisational development and AI transformation that take ethics and sustainability into consideration.

Sustainability labelling

The programme is sustainability-related, which means that at least one of the outcomes clearly shows that the programme content meets at least one of the University of Gothenburg's confirmed sustainability criteria.

6. Content and structure

The programme departs from the assumption that the development and integration of AI in everyday practices requires deep understanding of the relationship between the technology and individuals, groups, organisations, societies, and cultures. It prepares students to take an active role in designing, evaluating and researching how applications of AI are developed, implemented and used. The courses in the first year of the programme give both introductory and in-depth knowledge in the central theories in the field, as well as methods for research and development work.

The first year introduces a wide range of concepts relevant to human-centered AI and provides students with opportunities to develop practical skills for designing experiences with AI, evaluating its use and defining strategies for its implementation. Throughout the courses of the first year, students work with a variety of research methods that are useful for both career designing, implementing and evaluating applications of AI, and for the thesis project that is the culmination of the programme. The second year provides students with the opportunity to choose from a range of elective courses or take a semester abroad at a partner university before completing a thesis. The thesis consists of an independent degree project, allowing students to deeply engage in a specific research question related to the main field of study.

The education is given at full time. Courses are arranged for progression. In that vein, they develop topic-specific knowledge, while concurrently contributing to the advancement of general skills and abilities in the main field of study. The education involves lectures, practical assignments, and extensive individual reading. However, to produce a student-centred learning environment it frequently involves interactive seminars, case studies, supervision, and projects, where students apply and deepen their knowledge. The literature is in English, as well as all teaching and communication.

Study process

The programme consists of courses in the area of human-centered AI and related subjects. The programme includes a total of 120 credits. The first two semesters contribute 60 credits, distributed across four compulsory courses. The third semester consists of four recommended courses, contributing 30 credits. As an alternative to recommended courses, students may broaden their education through optional courses offered by University of Gothenburg or other

higher education institutions. The programme is concluded by a 30 credit independent degree project.

The study programme consists of the following compulsory courses:

- Introduction to Human-centered AI
- Interaction Design and AI
- Fairness, Accountability and Transparency in Artificial Intelligence
- Human-AI Communication
- Master's Thesis

The study programme also includes the following recommended elective courses:

- AI and Influence
- Digital Innovation in Sports
- Data and Society
- Project course

7. Guaranteed admission

Students who follow the study programme at the prescribed rate have general guaranteed admission for all courses stated in the syllabus.

'General guaranteed admission' means that the students admitted to the study programme have guaranteed admission to all of the compulsory and recommended courses in the programme syllabus provided that specific entry requirements are fulfilled and the student applies to the course within the study programme within the prescribed application period.

For optional courses outside the study programme local admission regulations are valid and there is no guaranteed admission.

8. Other information

Credit transfer of former education

In some cases, the student has the right to be given credit for former higher education according to the legislative regulations of the Higher Education Ordinance.

Evaluation

The courses of the study programme are evaluated according to each course syllabus. The result will be used for planning and implementation of upcoming courses. A summary is given to students at the start of the courses.

The study programme will be followed up and evaluated in accordance with the applicable *Policy för kvalitetssäkring och kvalitetsutveckling av utbildning vid Göteborgs universitet* (Policy for the Quality assurance and Quality Development of Education at the University of Gothenburg).