HAIC Report 2023

Introduction

Helsinki-Aalto Institute for Cybersecurity (HAIC) was established in 2016 as a joint strategic initiative by the Deans of Science at Aalto University (Aalto) and University of Helsinki (UH) with a mission to attract top master's students to the Helsinki area and train them in information security by offering them tuition fee waivers funded by the universities and living cost scholarships funded by industry donations. Today, HAIC's revised mission will attract students in all areas of security including security engineering, information security and cybersecurity.

The main activity of HAIC is fundraising for the scholarships. The total number and type of scholarships awarded yearly depends on the magnitude of donations received each year. In addition to scholarships, HAIC has pioneered in providing industrial interactions during studies and facilitating the search for internship and thesis positions by organising company visits and "Meet & Greet" events where students can meet company representatives. Since 2018 HAIC has begun to organize public outreach events under the *HAIC Talks* brand and Secure Systems annual demo days together with Secure Systems research groups at Aalto and UH. HAIC also has a research program (HAIC-R) as part of Helsinki Institute for Information Technology HIIT.[1]

Activities in 2023

Fundraising for scholarships

Sources of funding in 2023:

- Industry donations from WithSecure and SSH.COM towards
  - HAIC living cost scholarships
  - HAIC mobility scholarships

- Additional funding from Dean/SCI at Aalto for
  - participation costs scholarships for SECCLO students from EU countries at Aalto
  - HAIC public outreach program, including HAIC Talks

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[1] https://www.hiit.fi/research/#haic

Industry partners

HAIC industry partners were contacted by sending them a "letter to donors". The letter sought two kinds of donations: Full donations or supporting donations. It described proposed HAIC activities including the event where the donors and supporters can meet and interact with HAIC students. Fundraising for 2023 was successful: WithSecure re-joined as a donor and SSH continued a supporter.

HAIC Scholarships 2023

HAIC offers different kinds of scholarships to the best applicants specializing in information security: *living cost scholarships*, *SECCLO participation cost scholarships* and *mobility scholarships*.

HAIC *living cost scholarships* (7 500 €/academic year, that is, 750 €/month (Sep-June), in total 15 000 €/two academic years) are funded by donations from HAIC donors and supporters. The figure was chosen to cover the income requirement for the Finnish residence permit and to encourage the HAIC scholars to seek internships during summer as well as paid thesis positions. Due to high inflation during the recent years the monthly amount was raised from 700 to 750 € in the beginning of 2023. HAIC aims to offer up to four living cost scholarships per year, but the total number and type of HAIC scholarships awarded yearly depends on the magnitude of donations received that year.

HAIC offers *SECCLO participation cost scholarships* (6 000 €/two-year programme) for SECCLO (Erasmus Mundus funded Master's programme in Security and Cloud Computing) students coming from EU countries.

HAIC *mobility scholarships* are offered to Aalto University students for exchange studies in the field of information security. HAIC grants maximum ten mobility scholarships, 500 € per year, on top of Aalto Free Mover Scholarship of 1 500 € according to the School of Science policy for international exchanges (Decision 12/2019 of Manager of Academic Affairs).

HAIC Scholars 2023:

- *HAIC living cost scholarships*: HAIC offered two scholarships to CCIS/major (Security and Cloud Computing major within the Master's Programme in Computer, Communication and Information Sciences) and one applicant accepted the offer.

- *SECCLO participation cost scholarships*: HAIC offered three scholarships to cover programme participation costs and two applicants accepted the offer.

- *Mobility scholarships*: 10 (annual max. amount) scholarships were granted in the January 2023 call.

Table 1. Summary of HAIC scholars 2023 at Aalto University.

Type of scholarship	Scholarship amount	Number of accepted scholarships
HAIC living costs scholarship	15 000 €	1
HAIC scholarship to cover SECCLO participation costs	6 000 €	2
HAIC mobility scholarships	500 €	10

HAIC scholarships 2023 were open to all applicants applying to the Security and Cloud Computing major within the Master's Programme in Computer, Communication and Information Sciences (CCIS), the SECCLO – Master's programme in Security and Cloud Computing (Erasmus Mundus) at Aalto University, and for the Master's Programme in Computer Science at the University of Helsinki. Scholarship information was published on HAIC website (https://haic.fi/scholarships/) and on program websites (https://www.aalto.fi/en/admission-services/scholarships-and-tuition-fees; https://secclo.eu/scholarships-and-fees/scholarship-and-fees/)

Information about the HAIC mobility scholarships was advertised on HAIC website (https://haic.fi/mobility-scholarships-2023/), and in the Aalto University student newsletter "Tuutti" published by the Department of Computer Science, and on the Aalto University exchange studies page https://into.aalto.fi/display/enopinnot/Funding.

Background statistics for application round 2023

Aalto University, School of Science

The Security and Cloud Computing major within the master's Programme in Computer, Communication and Information Sciences (CCIS)

CCIS/major received 227 eligible applications out of which 28 students were selected and finally, 10 students enrolled for the academic year 2023-2024. The number of eligible applications increased 55 % compared to application round 2022.

SECCLO – master's programme in Security and Cloud Computing (Erasmus Mundus)

SECLLO received 568 eligible applications out of which 81 students were selected. 24 students enrolled for the academic year 2023-2024 representing 18 nationalities. The number of eligible applications increased 12 % compared to application round 2022.

Altogether 34 new students started their studies in autumn 2023 in the field of Security and Cloud Computing.

University of Helsinki

University of Helsinki has two master's programmes in which it is possible to study a major within the HAIC scope. These are "master's Programme in Computer Science" and "master's Programme in Data Science". The primary program is the former. It includes the "Networking and Services" study line with information security as one of the main ingredients. Recipients of the scholarships are selected as part of the university-wide process. All applicants for the master's Programme in Computer Science are considered for the HAIC scholar positions.

Master's programme in Computer Science received 790 applications out of which 111 were selected. Finally, 33 students started in the programme, 20 with a tuition fee waiver. For the master's programme in Data Science, the numbers are: 786 applications, 64 were selected, and 26 started, 13 with a tuition fee waiver.

Altogether 59 new students started their master's studies in autumn 2023.

Industry outreach

Meet and Greet events

HAIC organises "Meet and Greet" evenings once a year, where information security students can meet and mingle with representatives from industry. During the Meet and Greet evening HAIC presents its yearly report; selected industry partners present their companies and advertise available internship/thesis positions. An onsite event was held on October 26 for the 2022 intake students and on November 2 for the 2023 intake students.

Company visits

HAIC started to organise company visits from the beginning of 2018. The idea is to connect information security students with the local information security companies, so that they can learn about available thesis and internship positions, part-time jobs, and eventually full-time jobs after graduation.

Two company visits were organised in the end of 2022 to visit HAIC sponsor companies, WithSecure and SSH. The max. number of students, ~25 per company, attended the visits.

HAIC Talks

HAIC donors can have company stands before HAIC talks where they can interact with students. Positive feedback was received from students and donors alike.

Public outreach "Information security affects everyone"

Nyberg Fest

To honour the work of Emerita Kaisa Nyberg, a fest to celebrate Kaisa's achievements was organized on October 27, 2023, by HAIC and CS Department / Aalto University. CS crypto professors were responsible of planning the scientific program for the half-a-day research seminar. A portrait of Kaisa was ordered from Erica Nyholm and it will be revealed in the fest. The portrait will be placed in the CS building, and we hope that it will inspire and encourage our current and future students and researchers to pursue a career in a STEM field. About 80 participants attended the event.

HAIC Talks

HAIC has organised **HAIC Talks**, a series of public lectures on contemporary topics in information security, since 2018. In the style of *studia generalia*, these lectures are free and open to everyone. No background knowledge in information security is assumed. HAIC Talks are made possible through the generous support of the Aalto University School of Science.

HAIC Talks Oct 2022-Oct 2023:
- **27 April 2023: Privacy in 5G – Explained at the example of Pretty Good Phone Privacy (PGPP)– with Silke Holtmanns**
- **12 December 2022: Unpatched Design Vulnerabilities in Cellular Standards – with Yongdae Kim**
- **31 October 2022: Current State of Applied Cryptography – Attacks, Standardization, Government Requirements, and Best Practices – with John Mattsson**

Online HAIC talks have been very successful with more than 130 registrations per each talk. Turnout has been high with more than 100 participants in each talk and discussion active.

Secure Systems Demo Days

Secure Systems Demo Days are annual public events to showcase on-going security research at Aalto and UH. The events intend to bring local academia, students, and industry together and give an excellent opportunity to network and search possibilities for collaboration and for open positions within the local infosec industry and academia. Secure Systems Demo Days are public events and free of charge. Events are organized by the Secure Systems research groups at Aalto University and University of Helsinki in collaboration with HAIC. Secure Systems Demo Day 2023 was held in the CS building at Aalto University on June 8 with 20 research posters/demonstrations and six company desks

(Elisa, Ericsson, Huawei, Nokia Bell Labs, Nvidia, SSH and WithSecure). About 120 participants registered for the 2023 demo day.

Cybersecurity Base

University of Helsinki runs a Massive Open Online Course (MOOC) under the title "Cyber Security Base". The course was originally developed together with F-Secure and was run in a scheduled format until 2022. The course is open to everyone and at least the first part "Introduction" (worth 1 study credit) is also intended for the general public who want to learn the basics of cybersecurity. The total volume of the course is 10 study credits. The course series consists of 6 smaller courses, each with a specific theme. Themes include a brief introduction to cyber security, operational security, web software development, types of vulnerabilities typical of web software, discovery and mitigation of such vulnerabilities, and advanced topics such as secure software architectures and cryptography. There are several case studies as well as projects for participants. The 2023 edition opened in February.

HAIC communications

HAIC communicates about its activities and news on its website https://haic.fi/. In addition, HAIC has a Twitter and Facebook account to share information about HAIC related news and events.

# People behind HAIC

HAIC leadership comprises:

- Professor Janne Lindqvist, Aalto University - Director of HAIC
- Professor Valtteri Niemi, University of Helsinki - Director of HAIC Research Program at Helsinki Institute for Information Technology (HIIT)
- Dr. Mohit Sethi, Aalto University - Deputy director of HAIC, Head of HAIC public outreach program
- Eija Kujanpää, Aalto University - Manager, international relations, coordinator of the HAIC scholarship schemes at Aalto University
- Niina Idänheimo, Aalto University - Coordinator

HAIC leadership team had an annual strategy meeting with the Dean/SCI at Aalto on March 31, 2023. The meeting covered HAIC's mission and activity plan, funding scheme and added value to the university.

HAIC leadership team's meeting with HAIC sponsors for feedback on HAIC activities, study programmes, and to further develop joint research activities was held on November 2, 2023.

Outlook

HAIC's mission is to attract the best students to study information security at Aalto and at the University of Helsinki by providing them financial support and industry contacts during studies. HAIC hopes that the corresponding universities will promote and market the information security study tracks world-wide. The Erasmus Mundus funded SECCLO – Master's Programme in Security and Cloud Computing has helped this mission greatly and the number of applications has increased during the SECCLO program. The SECCLO program with 84 scholarships (intake 2021-2024) with the last students to graduate in 2026, has attracted some of the most talented master's students from around the world to study security at Aalto.
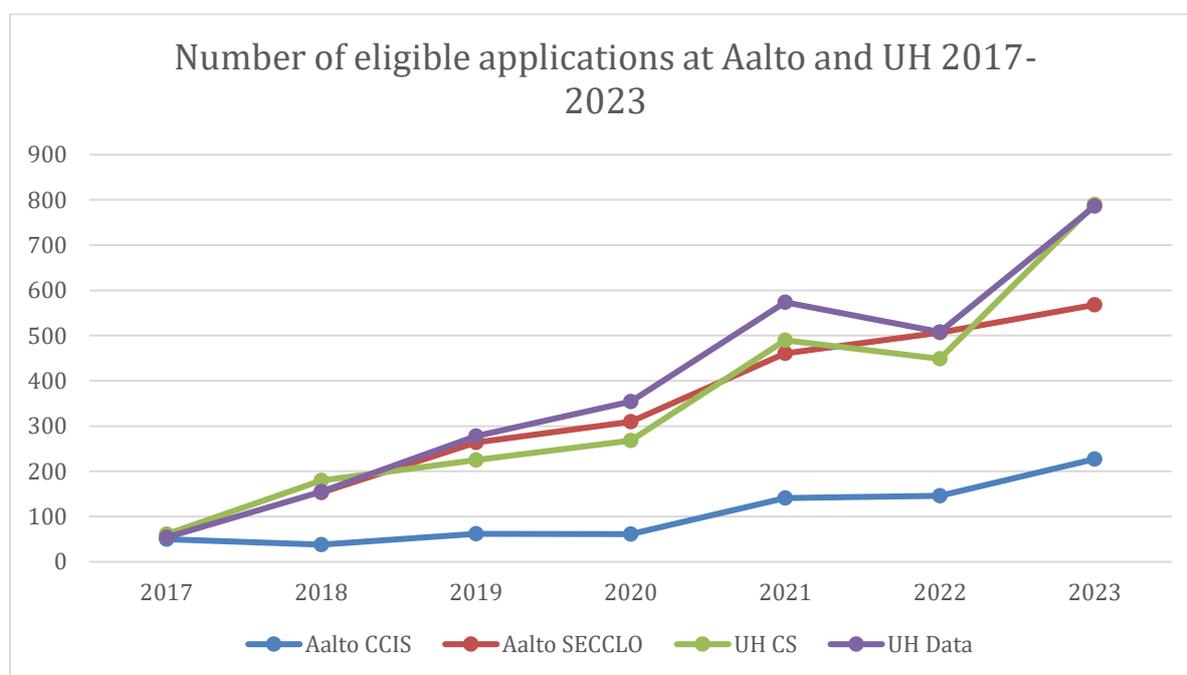
Figure 1. The number of eligible applications for security master's programmes at Aalto and UH have increased since the establishment of HAIC and during the SECCLO program.

Industry collaboration is in the heart of HAIC's mission, and we want to make sure that our students want to stay and work in Finland after graduation. Our asset is a lively ecosystem of security experts and students that meet regularly. We will keep on organizing company visits and other events where students can interact with industry and academia experts in a relaxed setting, learn about job opportunities and working culture in Finland, and perhaps find potential employers.

HAIC's current donors have expressed their will to continue supporting our scholarship program also in subsequent years. We welcome also new industry partners to join the program. The call for HAIC industry donors is open throughout the year!