Department of Computer Science

Annual Report 2018

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The year 2018 was very good for the department – the 51st year of the department and the first year with the new faculty organization structure. Our vision of being and educating "the architects of the digital world" is going strong. The department has excelled in the three key dimensions: research, education, and societal impact. I will briefly summarize the main highlights in these three dimensions.

The number of professors has been growing from 19 in 2017 to 24 in 2018, with our plan reaching to 30 professors in the near future. This year Keijo Heljanko started as Full Professor, and we have recruited many tenure track professors. Michael Mathioudakis started as Assistant Professor, and Matti Järvisalo, Laura Ruotsalainen, Petteri Nurmi, and Kai Puolamäki started as Associate Professors.

We have very successfully launched two new centers, namely the Finnish Center for AI (FCAI) with Aalto University and VTT, and the Helsinki Centre for Data Science (HiDATA) with Aalto University. Both centers are doing very well and have achieved wide visibility. FCAI pioneered by the UH champions Petri Myllymäki and Patrik Floréen was selected as one of the six national flagship centers by the Academy of Finland. In 2018, we also completed most of the eight tenure track recruitments for HiDATA. In addition, we received very good top publication impact ranking in the Academy of Finland "State of Scientific Research in Finland" report.

We have good news regarding the share of women at the department. The share of women starting in our degree programmes has increased 24% since last year to 28%, and at the beginning of 2019, we'll have three female professors at the department.

We have almost doubled the level of external funding granted to the department. To give some numbers, our external funding was 5.4 MEUR in 2014, and now it is 8.4 MEUR. The external budget has increased linearly each year.

Our degree programmes are among the most popular at the university. We had 22% increase in the B.Sc. programme applications this year. Altogether we give out about 50 000 credit points each year. Thus, we have a great responsibility over major and minor studies at the Faculty of Science.

Opening our education and developing our MOOC portfolio have been important topics during the year. Teemu Roos has achieved a global success story with the Elements of AI course. We have also continued to develop our MOOCs pioneered by Arto Hellas, Matti Luukkainen and Kjell Lemström. One of the strategic goals is to open our education and make it easy to find our courses and then once aptitude is demonstrated gain study rights. We have received a significant funding for the Digital Education for All project (DEFA) led by Kjell Lemström that is now opening our education in collaboration with other universities in Finland.

The department is growing, and we have now completed the renovation of the Ubikampus smart space. We have the first researchers moving in the first week of January 2019 to the place. The Ubikampus is looking very good, we have many new services and a living lab environment for 60 researchers. This space will be the first Ubikampus pilot with new technology supporting work and wellbeing. Vice-dean Hannu Toivonen and Ubikampus coordinator Petri Savolainen have pioneered this activity.

We have had significant impact in the digitalization aspects of our university spanning strategy, infrastructure and education. I would like to mention TOSKA, our code academy, and Oodikone pioneered by Matti Luukkainen and Kjell Lemström. Oodikone is now being taken into use by degree programmes for study related analytics.

I would like to thank everyone for their excellent work at the growing department.

Sasu Tarkoma
Professor, Head of Department 2018

2. Teaching 2018

The basic degrees of the educational programmes at the department of computer science are the Bachelor of Science (BSc) and Master of Science (MSc) degrees. The higher degrees in computer science are the Licentiate (PhLic) and the Doctoral (PhD) degrees. The teaching at the department follows a high standard and is based on the research carried out at the department and its focus areas. The degrees offered by the educational programmes at the department are high in quality and socially relevant.

2.1. Educational programmes

The new educational programmes at the University of Helsinki were launched in 2017. Among these programmes, the department is in charge of the Bachelor's Programme in Computer Science, and the Master's Programmes in Computer Science and Data Science. Furthermore, the department participates in the Bachelor's Programme in Mathematics (the computer science theory sub-programme), the Master's Programme in Theoretical and Computational Methods, and in the Master's Programme in Life Science Informatics. The department is also responsible for the Doctoral Programme in Computer Science, DoCS, which was launched along with other doctoral programmes at the University of Helsinki in 2014.

The teaching at the departments was transferred to the new education programmes at the beginning of autumn 2017. Students who have been admitted earlier can, if they so wish, continue in accordance with the old system during a transit period up until 31 July 2020.

2.1.1. Bachelor's Programme in Computer Science

The Bachelor's degree consists of a comprehensive education in computer science offering a solid basis for the specialisation built during the Master's stage and preparing for work in the field of ICT. The education combines theory with practice. The instruction is based in practice from the beginning, including guided exercises and collaboration projects using professional tools. The curriculum follows international norms and guidelines and cover the main fields of computer science, such as software and algorithms, information management and security, user interfaces, computer architecture, operating systems, and data communication.

Director of the programme in 2018: University Lecturer Kjell Lemström
Web pages of the programme: https://www.helsinki.fi/fi/ohjelmat/kandi/tietojenkasittelytieteen-kandio-hjelma

2.1.2. Master's Programme in Computer Science

The Master's Programme in Computer Science enables students to develop into experts in one of the sub-fields of computer science within the programme (algorithms, networking and systems, or software engineering). The education provides lasting professional skills for specialist, design, or managerial posts in the corporate world, or research and doctoral education, since the Master's Programme in Computer Science creates an aptness for both independent working and multi-professional teamwork.

Director of the programme 2018: Professor Veli Mäkinen
Web pages of the programme: https://www.helsinki.fi/en/programmes/master/computer-science

2.1.3.   Master's Programme in Data Science

Data science is a modern combination of computer science and statistics to solve the problems of analysing and utilising different kinds of data within industry, administration, and research. The Master's Programme in Data Science gives students a deep understanding of the central concepts, theories, and research methods of data science while teaching them to apply these skills in practice and create solutions for new challenges in data science. The Department of Computer Science, the Department of Mathematics and Statistics, and the Department of Physics at the University of Helsinki are in charge of the implementation of the education programme. Other contributors to the programme are HIIT and HIP.

Director of the programme in 2018: Professor Jussi Kangasharju
Web pages of the programme: https://www.helsinki.fi/en/programmes/master/data-science

2.1.4.   Doctoral Programme in Computer Science

The doctoral degree in computer science aims at attaining a deeper knowledge in one of the areas of computer science and the ability to produce new scientific insights in this area. The education also gives its students various knowledge-work skills that, coupled with the in-depth knowledge of the scientific field, give the graduates of the doctoral programme in computer science the competence to work in demanding multi-disciplinary research and expert posts both in Finland and abroad.

The Doctoral Programme in Computer Science, DoCS, is actively cooperating with Helsinki Institute for Information Technology HIIT, EIT Digital, the Inforte.fi network, and the CS departments at Aalto University through, e.g., the shared doctoral education network HICT.

Director of the programme in 2018: Professor Tomi Männistö
Web pages of the programme: http://www.helsinki.fi/doctoral-programme-in-computer-science

2.2. Further development of teaching

The department has made a long-term investment in teaching and its further development. The department used to be one of the national centres of excellence in higher education, which have not been appointed since 2012. The quality assurance system at the University of Helsinki passed an international audit in 2015. One of the assessment and visiting points was the basic teaching at the department, which gained the highest possible grade, 'advanced,' in the audit.

As a new opening in teaching in 2018, a DEFA – Digital Education for All project was started at the department. The DEFA project is funded by the Finnish Ministry of Education and Culture (approx. 1.5 MEUR), and it is a joint project of five Finnish universities (Aalto University and the universities of Helsinki, Oulu, Jyväskylä and Turku). In the DEFA project, all the first-year courses of the Bachelor's studies in computer science have been opened as free online courses for everyone. This project makes it possible to complement one's knowledge and skills in computer science without any temporal or spatial limits; diligent DEFA students can even gain admission to one of the educational programmes participating the project. The DEFA project has

received plenty of attention in the Finnish media, and since autumn 2018 there has already been over 100 students in the courses of the Department of Computer Science at the University of Helsinki. The director of the DEFA project is University Lecturer Kjell Lemström.

University Lecturer Matti Luukkainen is the department's representative in the Teacher's Academy at the University of Helsinki, which was launched in 2013.

In the action period 2018, there were two main focal points with research at the department; computer science and the newly established data science based in computer science. Within these two focal points, main research fields at the department are artificial intelligence, big data frameworks, bioinformatics, data analysis, data science, discrete and machine learning algorithms, distributed, intelligent and interactive systems, networks, security, and software and database systems. There was also some research in other fields of social and financial importance carried out at the department.

Research groups at the department are divided roughly by their main research methods into four research areas (algorithms, artificial intelligence, networks, and software); some groups work actively on many areas. The collaboration between the groups is also represented in bigger units such as [Helsinki Centre for Data Science (HiData)](), [Finnish Center for Artificial Intelligence (FCAI)](), [Helsinki-Aalto Center for Information Security (HAIC)](), [Foundations of Computational Health (FCHealth) programme]() and the [Bioinformatics research community]() at the University of Helsinki.

In 2018, 32 research groups were active at the department. Some of these research groups are also part of HIIT, Helsinki Institute for Information Technology shared by the University of Helsinki and Aalto University. Furthermore, the department research groups have close collaborations with various research units at the University of Helsinki, as well as corporations and other universities.

The department has participated in a bid to strengthen the profile of the University of Helsinki in the Finnish Academy's profiling funding. The number of professors at the department will be raised significantly on the strength of this. The first two tenure-track professors funded in this way started working at the department in 2017. In 2018, three tenure-track professors and one full professor started working at the department with this profiling funding, and one more professor with other funding. In 2019, they will be joined by four other tenure-track professors and one full professor.

3.1. Helsinki Institute for Information Technology HIIT

Many of the department's research groups are also active within the Helsinki Institute for Information Technology, HIIT (http://www.hiit.fi), a collaboration between the University of Helsinki and Aalto University. Its mission is to carry out high-end international basic and strategic research in information technology, and to promote the competitiveness of the ICT industry in the long run by bringing together Finnish university research with the industrial innovation chain, especially in the field of long-term strategic product development. It is also the duty of HIIT to carry out multi-disciplinary collaborations with different fields of research in universities and research institutes.

In 2018, HIIT carried out the following research programmes:
- Finnish Center for Artificial Intelligence (FCAI), headed by Professor Samuel Kaski (Aalto University);
- Foundations of Computational Health (FCHealth), headed by Professor Juho Rousu (Aalto University);
- Helsinki-Aalto Center for Information Security (HAIC-R), headed by Professor Valtteri Niemi;
- Helsinki Centre for Data Science (HiData), headed by Professor Sasu Tarkoma;
- Augmented Research, headed by Professor Giulio Jacucci; and
- Computational Inference (COIN), headed by Professor Samuel Kaski (Aalto University).

In 2018, the director of HIIT was Professor Petri Myllymäki from the department. Vice-directors of HIIT were University Lecturer Patrik Floréen (UH) and Associate Professor Kai Puolamäki (Aalto University; from 1 September 2018 on UH).

In the Board of HIIT, the University of Helsinki was represented by Professor Sasu Tarkoma (deputy member Professor Valtteri Niemi) as well as Dean Paula Eerola (until July 2018; deputy member Professor Hannu Toivonen) and Dean Kai Nordlund (since August 2018; deputy member Professor Hannu Toivonen). Patrik Floréen acted as the secretary of the Board of HIIT.

3.2. Research groups

In 2018, 32 research groups were active at the department within the four research areas: Algorithms, Artificial Intelligence, Networks, and Software. Some of the groups are only active within one of these areas, but some include several in their work.

3.2.1. Algorithms

The development of algorithms to well-defined problems, mathematical exact method, and computational modeling characterize the approaches to tackle difficult problems in this research area. Some of the researchers focus on theoretical aspects of computation, some focus on more practical algorithm engineering and optimization, and some focus on tailoring algorithms to problems arising from bioinformatics. Specific research areas under study are algorithmic approaches to artificial intelligence and machine learning, exact algorithms for NP-hard problems, string processing and sequence analysis algorithms, succinct data structures, and modeling of biological systems such as evolution.

A total of 12 research groups worked in the area of Algorithms at the department in 2018 (Table 3.1.). The person in charge of this research area is Professor Jyrki Kivinen.

Research group	Contact person
Algorithmic Learning Theory http://www.cs.helsinki.fi/tutkimus/machine-learning	Professor Jyrki Kivinen
Algorithms for Biological Sequencing Data https://www.helsinki.fi/en/researchgroups/bioinformatics/research-groups#section-33112	Academy Research Fellow Leena Salmela
Bioinformatics and Evolution https://www.helsinki.fi/en/researchgroups/bioinformatics-and-evolution	Professor Ville Mustonen
Combinatorial Pattern Matching http://www.cs.helsinki.fi/research/algodan/cpm/	Emeritus Professor Esko Ukkonen
Compressed Data Structures https://www.cs.helsinki.fi/u/puglisi/	Academy Research Fellow Simon Puglisi
Constraint Reasoning and Optimization (CoReO) https://www.helsinki.fi/en/researchgroups/constraint-reasoning-and-optimization	Associate Professor Matti Järvisalo
Genome-scale Algorithmics https://www.helsinki.fi/en/researchgroups/genome-scale-algorithmics	Professor Veli Mäkinen
Practical Algorithms and Data Structures on Strings (PADS) http://www.cs.helsinki.fi/group/pads/	University Lecturer Juha Kärkkäinen

Research group	Contact person
Sums of Products http://www.cs.helsinki.fi/u/mkhkoivi/sopu.shtml	Associate Professor Mikko Koivisto
Algorithmic Data Science https://michalis.co/	Assistant Professor Michael Mathioudakis
Data Science and Evolution https://www.helsinki.fi/en/researchgroups/data-science-and-evolution	Assistant Professor Indrė Žliobaitė
Exploratory Data Analysis http://www.helsinki.fi/exploratory-data-analysis	Associate Professor Kai Puolamäki

Table 3.1. Research groups in Algorithms in 2018.

3.2.2. Artificial Intelligence

This research area develops novel methods of artificial intelligence, machine learning and data mining, with the aim of creating computationally efficient, theoretically justified and reliable methods. Research groups also apply these methods broadly to the various tasks, from computational creativity to modelling evolution.

A total of 14 research groups worked in the area of Artificial Intelligence at the department in 2018 (Table 3.2.). The person in charge of this research area is Professor Petri Myllymäki.

Research group	Contact person
Algorithmic Data Science https://michalis.co/	Assistant Professor Michael Mathioudakis
Complex Systems Computation (CoSCo) http://old.hiit.fi/cosco	Professor Petri Myllymäki
Computational Creativity and Data Mining https://www.helsinki.fi/en/researchgroups/computational-creativity-and-data-mining	Professor Hannu Toivonen
Computational Linguistics http://puls.cs.helsinki.fi	University Researcher Roman Yangarber
Data Science and Evolution https://www.helsinki.fi/en/researchgroups/data-science-and-evolution	Assistant Professor Indrė Žliobaitė
Data Science for the Masses http://www.anttiukkonen.com/main/	Academy Research Fellow Antti Ukkonen
Exploratory Data Analysis http://www.helsinki.fi/exploratory-data-analysis	Associate Professor Kai Puolamäki
Information, Complexity and Learning (ICL) http://old.hiit.fi/cosco/promo	Associate Professor Teemu Roos
Multi-source Probabilistic Inference (MUPI) https://www.helsinki.fi/en/researchgroups/multi-source-probabilistic-inference	Assistant Professor Arto Klami

Research group	Contact person
Neuroinformatics http://www.cs.helsinki.fi/u/ahyvarin/group.shtml	Professor Aapo Hyvärinen
Bioinformatics and Evolution https://www.helsinki.fi/en/researchgroups/bioinformatics-and-evolution	Professor Ville Mustonen
Constraint Reasoning and Optimization (CoReO) https://www.helsinki.fi/constraint-reasoning	Associate Professor Matti Järvisalo
Spatiotemporal Data Analysis http://www.helsinki.fi/spatiotemporal-data-analysis	Associate Professor Laura Ruotsalainen
Sums of Products http://www.cs.helsinki.fi/u/mkhkoivi/sopu.shtml	Associate Professor Mikko Koivisto

Table 3.2. Research groups in Artificial Intelligence in 2018.

3.2.3.   Networks

The NODES unit (Networking in Open Distributed Environments) coordinates collaboration between distributed systems and telecommunication research groups. The focus areas are networked systems and their enablers: interoperability (e.g., service and software platforms, interoperability management, contracting, trust management, privacy), mobility (technology and location independence, wireless computing), information networks, service networks, context awareness and ubiquitous computing. The research groups combine the departmental tradition of wireless and mobile computing to new research themes. The focus of the groups is in transition from platform protocols to solving application layer challenges.

A total of 10 research groups worked in the area of Networks at the department in 2018 (Table 3.3.). The person in charge of this research area is Professor Valtteri Niemi.

Research group	Contact person
Collaborative and Interoperable Computing (CINCO) http://cinco.cs.helsinki.fi	University Lecturer Lea Kutvonen
Collaborative Networking (CoNe) http://www.helsinki.fi/collaborative-networking/	Professor Jussi Kangasharju
Content-centric Structures and Networking (COSN) http://www.cs.helsinki.fi/research/nodes	Professor Sasu Tarkoma
Secure Systems http://www.cs.helsinki.fi/group/secures/	Professor N. Asokan and Professor Valtteri Niemi
Spatiotemporal Data Analysis http://www.helsinki.fi/spatiotemporal-data-analysis	Associate Professor Laura Ruotsalainen
Systems and Media https://www.cs.helsinki.fi/u/panhui/	Professor Pan Hui
Parallel and Distributed Computing https://researchportal.helsinki.fi/en/persons/keijo-tapio-heljanko	Professor Keijo Heljanko
Pervasive Data Science http://pds.cs.helsinki.fi	Associate Professor Petteri Nurmi

Research group	Contact person
Wireless Internet (WInt) http://www.cs.helsinki.fi/re-search/nodes/wireless.shtml	Lecturer Markku Kojo
Ubiquitous Interaction https://www.cs.helsinki.fi/en/nodes/ubiquitous-interaction	Professor Giulio Jacucci

Table 3.3. Research group in Networks in 2018.

3.2.4.   Software

Software is central to almost all industries, as more and more industrial products are actually software products. The software research area concerns the development of software, database and interactive systems, as well as the research related to teaching of programming and learning analytics.

Four research groups were active in the area of Software at the department in 2018 (Table 3.4.). The person in charge of this research area is Professor Tomi Männistö.

Research group	Contact person
Empirical Software Engineering (ESE) https://www.helsinki.fi/en/researchgroups/empirical-software-engineering	Professor Tommi Mikkonen and Professor Tomi Männistö
Data Driven Educations - Agile Education Research (RAGE) https://www.helsinki.fi/en/researchgroups/data-driven-education	University Lecturer Matti Luukkainen
Ubiquitous Interaction https://www.cs.helsinki.fi/en/nodes/ubiquitous-interaction	Professor Giulio Jacucci
Unified Database Management Systems (UDBMS) http://udbms.cs.helsinki.fi/	AssociateProfessor Jiaheng Lu

Table 3.4. Research groups in Software in 2018.

3.3. Research collaboration

The Department of Computer Science and its research groups also carry out many research collaborations both within the University of Helsinki and outside it. Partners include both other universities and various corporations, both in Finland and abroad.

There is a bioinformatics research community at the University of Helsinki with research groups from different faculties at the university. Members of the community hailing from the Department of Computer Science in 2018 were the research groups of Professor Ville Mustonen, Professor Veli Mäkinen, Academy Fellow Simon Puglisi, Academy Fellow Leena Salmela, and Emeritus Professor Esko Ukkonen.

The *Helsinki Institute of Life Science* (HiLIFE), established in 2017, is a research institute at the University of Helsinki, which supports and combines groups and researchers carrying out high-level research into life sciences at the different campuses and faculties of the university. Participants in HiLIFE from the department in 2018 were Professor Ville Mustonen and Assistant Professor Indrė Žliobaitė.

Helsinki Centre for Digital Humanities (HELDIG) is a national research network and infrastructure, where researchers use computational methods to solve problems within the humanities and social sciences, as well as study digitalisation in general as a phenomenon. From spring 2018, Assistant Professor Michael Mathioudakis from the Department of Computer Science has participated in HELDIG.

In 2017, the University of Helsinki and Aalto University started a research collaboration, *Helsinki Centre for Data Science* (HiDATA). In 2018, Head of the Department of Computer Science, Professor Sasu Tarkoma was the director of the centre. Assistant Professor Indrė Žliobaite and University Lecturer Patrik Floréen were, in turn, the vice directors of HiDATA.

The Department of Computer Science also cooperates in the national *Finnish Center for Artificial Intelligence* (FCAI) with Aalto University and the Technical Research Centre of Finland. In 2018, the representatives for the University of Helsinki and the Department of Computer Science in FCAI were Professor Petri Myllymäki, Assistant Professor Arto Klami, Associate Professor Teemu Roos and University Lecturer Patrik Floréen.

Since 2016, the Department of Computer Science has participated in the *Helsinki-Aalto Center for Information Security* (HAIC), a strategic collaboration between the University of Helsinki and Aalto University with the objective of promoting research and education in information security in the Helsinki region. In 2018, Professor Valtteri Niemi and his research group from the Department of Computer Science participated in HAIC.

The Department of Computer Science also carried out significant research collaborations with various corporations. For example, the *Nokia Center for Advanced Research* (NCAR) was still working at the department. In addition to that, various research groups have joint projects with several corporations.

3.4. Research and teaching infrastructures

There are several different infrastructures for research and teaching at the Department of Computer Science. They include science class Linkki, the Software Factory, Interaction Lab, Nodes lab, and the Ukko computing clusters.

Linkki (*http://linkki.cs.helsinki.fi*) is a science class operating at the Department of Computer Science, which organises hobby activities for middle- and upper-secondary school pupils, where young people interested in computer science can meet each other and learn about subjects that interest them. Linkki is also a meeting place for teachers needing complementary education. Linkki belongs to the science education centre at the University of Helsinki, and thereby also a part of the national network LUMA centre Finland. The director of Linkki was University Lecturer Lea Kutvonen in 2018, while Virpi Sumu and Jenna Tuominen were the coordinators.

Software Factory (*http://www.softwarefactory.cc*) forms a shared platform to combine commercial software engineering with theoretical and applied research and teaching in software engineering. Software Factory is an experimental software research-and-design laboratory with the objective of inspiring learning, promoting

multidisciplinary research, and encouraging entrepreneurship. In 2018, Empirical Software Engineering (ESE) research group led by Professors Tommi Mikkonen and Tomi Männistö was in charge of the Software Factory.

Interaction Lab is a research infrastructure developed by the Ubiquitous Interaction research group in 2014. The lab offers the opportunity to study the interaction between people, computers, and the physical surroundings, and develop new methods for them. For these purposes, the Interaction Lab is fitted with modern equipment including both fixed and removable eye-movement sensors, various physiological sensors (EDA, HRV, fEMG), EEG equipment, large touch screens, various haptic devices, and sensors for discovering movement. In 2018, Professor Giulio Jacucci was in charge of the Interaction Lab.

The NODES lab (http://www.cs.helsinki.fi/en/nodes/nodes-laboratory) is an experimental computer-science research and education infrastructure especially for ubiquitous and mobile computing. The lab contains infrastructure that is vital for research in the area, such as networks and test frameworks for developing new network protocols and routing algorithms, a room for wireless measurements protected against interference, and the smart screens and sensors necessary for interactive computing. The lab supports the research and teaching at the Department of Computer Science and boosts the department's profile in networks and systems Professor Sasu Tarkoma was the contact officer for the NODES lab in 2018.

Ukko1, the computer cluster at the Department of Computer Science acquired at the end of 2009, served researchers of the department until 2017, when it was replaces with a more effective and modern cluster, [Ukko2](). At the same time, the responsibility of running the clusters was transferred from the department to the IT for Science unit at the Kumpula campus. The Ukko2 cluster was still actively used by the researchers of the department in 2018.

In 2018, the head of the department was in charge of the work of the department along with the deputy head. Head of Department was Professor **Sasu Tarkoma** and his deputy was Professor **Valtteri Niemi**.

New Bachelor's and Master's programmes were launched at the University of Helsinki in autumn 2017. Head of Studies **Kjell Lemström** was the director of the Bachelor's Programme in Computer Science, and Professor **Veli Mäkinen** of the Master's Programme in Computer Science in 2018. Professor **Hannu Toivonen** was the director of the Master's Programme in Data Science until the end of October 2018, and Professor **Jussi Kangasharju** from the beginning of November 2018. Professor **Tomi Männistö** was the director of the department's doctoral programme (DoCS) in 2018.

Research at the department was organised into research units and groups. The Helsinki Institute for Information Technology HIIT (an institute co-run with Aalto University), where Professor **Petri Myllymäki** was director and University Lecturer **Patrik Floréen** and Associate Professor **Kai Puolamäki** (until August 2018 at Aalto University) were vice-directors in 2018, operates at the department. Some of the department's research groups work within HIIT.

Head of Studies **Kjell Lemström** was in charge of teaching administration at the department in 2018, in cooperation with the education programme planners and heads of education programmes within the University of Helsinki service organisation. Research Coordinator **Pirjo Moen** was in charge of research and postgraduate education administration, and IT Manager **Petri Kutvonen** of the IT services at the department. General, HR, and financial administration was in the charge of the service organisation of the University of Helsinki. Further, the department has a steering group, boards of the education programmes, and a wellbeing team. Employees of the department were also represented in several faculty and university committees and in organisations outside the university.

4.1. Committee memberships

Department steering group
- *Sasu Tarkoma (chair)*
- *Patrik Floréen*
- *Jussi Kangasharju (from November)*
- *Jyrki Kivinen*
- *Petri Kutvonen*
- *Kjell Lemström*
- *Pirjo Moen*
- *Petri Myllymäki*
- *Veli Mäkinen*
- *Tomi Männistö*
- *Valtteri Niemi*
- *Hannu Toivonen*
- *Pirjo Mulari (secretary)*

Board of the Doctoral Programme in Computer Science (DoCS)

- *Tomi Männistö (director)*
- *Pan Hui*
- *Giulio Jacucci*
- *Jyrki Kivinen*
- *Pirjo Moen*
- *Ville Mustonen*
- *Indrė Žliobaitė*
- *Student members: Krista Longi, Sara Ramezanian*

Board of the Master's Programme in Computer Science

- *Veli Mäkinen (director)*
- *Jyrki Kivinen*
- *Mikko Koivisto*
- *Lea Kutvonen*
- *Tomi Männistö*
- *Valtteri Niemi*
- *Antti-Pekka Tuovinen*
- *Student members: Johannes Verwijnen, Henna Warva*

Board of the Master's Programme in Data Science

- *Hannu Toivonen (director, until October 2018)*
- *Jussi Kangasharju (director, from November 2018)*
- *Ari Asmi (Physics)*
- *Arto Hellas (deputy of Arto Klami in autumn 2018)*
- *Antti Honkela (Mathematics and Statistics)*
- *Arto Klami*
- *Teemu Roos*
- *Laura Ruotsalainen (from November 2018)*
- *Jarno Vanhatalo (Mathematics and Statistics)*
- *Student members: Jere Renlund, Johannes Verwijnen*

Board of the Bachelor's Programme in Computer Science

- *Kjell Lemström (director)*
- *Patrik Floréen*
- *Arto Hellas*
- *Jyrki Kivinen*
- *Matti Luukkainen*
- *Tommi Mikkonen*
- *Tiina Niklander*
- *Student members: Heikki Ahonen, Henna Warva*

Wellbeing at Work group

- *Valtteri Niemi (chair)*
- *Rola Alhalaseh*

- *Jussi Hartikainen*
- *Minna Lauri*
- *Julien Mineraud*
- *Antti-Pekka Tuovinen*

4.2. Department representatives and liaison officers

University of Helsinki
- *University collegium in 2018-2022: Petri Myllymäki*
- *Academic affairs council (ONE) in 2018-2021: Hannu Toivonen*
- *Board of the Open University in 2018-2022: Hannu Toivonen*
- *University's internationalisation committee (KANE) in 2018-2023: Hannu Toivonen*
- *University library board: Hannu Toivonen*
- *Board of the IT center: Hannu Toivonen*
- *Digitalisation programme working group in 2018-2020: Sasu Tarkoma*
- *Board of LUMA Science Education in 2017-2020: Sasu Tarkoma (deputy Veli Mäkinen)*
- *Collaboration taskforce for teaching and teaching support (OOTY) in 2017-2019: Tiina Niklander*
- *Steering committee for digital thesis processes in 2018-2019: Kjell Lemström*
- *Teachers' Academy: Matti Luukkainen*
- *Occupational safety organisation 2016-2019: Tiina Niklander (also vice chair of the campus committee in Kumpula)*
- *Taskforce for evaluation of instruction and research staff for adapting the salary system: Tiina Niklander*

Faculty of Science
- *Members of the Faculty Council in 2018-2021:*
  - *Tomi Männistö (deputy Tommi Mikkonen)*
  - *Sasu Tarkoma (deputy Matti Lassas, Mathematics and Statistics)*
  - *Pirjo Moen (deputy: Antti-Pekka Tuovinen)*
  - *Jukka-Pekka Eloranta (student member; deputy Henna Warva)*
- *Faculty board of directors in 2018-2021: Hannu Toivonen, Sasu Tarkoma*
- *Science and infrastructure board of the faculty (MATIAS) in 2018-2021: Giulio Jacucci (deputy Keijo Heljanko)*
- *Faculty group for the development of teaching in 2018-2021: Arto Hellas, Hannu Toivonen*
- *Faculty committee pool for pedagogical skills: Jyrki Kivinen (deputy Tommi Mikkonen), Kjell Lemström (deputy Antti-Pekka Tuovinen)*
- *Faculty admissions committee in 2018-2022: Jyrki Kivinen (deputy Tiina Niklander)*
- *Faculty facility-use steering group: Jyrki Kivinen*
- *Faculty communications group: Teemu Roos*
- *Faculty community relations committee: Jyrki Kivinen*
- *Taskforce for developing bilingual instruction at the Faculty in 2019-2021: Patrik Floréen, Pirjo Moen*
- *Board of the Doctoral School in Natural Sciences (DoNaSci) in 2018-2021: Tomi Männistö*
- *LUMA resource centre Linkki: Lea Kutvonen*

- *Building manager of Exactum: Jyrki Kivinen*
- *Campusgruppen (teaching collaboration in Swedish in Kumpula and Viikki): Patrik Floréen, Pirjo Moen*
- *IT for Science steering group: Sasu Tarkoma, Petri Kutvonen*
- *IT committee on Kumpula campus: Sasu Tarkoma, Petri Kutvonen*
- *Kumpula campus library advisory board in 2018-2022: Hannu Toivonen (chair), Jyrki Kivinen*
- *Kumpula health and safety committee in 2016-2019: Tiina Niklander (vice chair, staff representative), Antti-Pekka Tuovinen (staff representative)*
- *Kumpula deputy health-and-safety officer in2016-2019: Antti-Pekka Tuovinen*

Other organisations

- *Taskforce for national admission exam: Patrik Floréen*
- *Publication forum panel for data-processing and information sciences in 2018-2021: Tommi Mikkonen (chair)*
- *HIIT board: Sasu Tarkoma, Valtteri Niemi (deputy), Hannu Toivonen (deputy)*
- *Executive committee for the HICT doctoral education network: Petri Myllymäki (chair), Pirjo Moen*
- *Board of the HICT doctoral education network: Petri Myllymäki, Pirjo Moen, Jyrki Kivinen, Mikko Koivisto, Sasu Tarkoma, Tomi Männistö and Giulio Jacucci*
- *Advisory Committee of the Helsinki Doctoral Training Centre of the EIT Digital Doctoral School: Petri Myllymäki*
- *Helsinki Centre for Data Science (HiData): Sasu Tarkoma (director), Patrik Floréen (vice director), Indrė Žliobaite (vice-director), Ville Mustonen (member of board)*
- *Finnish Centre for AI (FCAI): Petri Myllymäki (vice director)*
- *Helsinki-Aalto Center for Information Security (HAIC): Valtteri Niemi (vice director)*
- *Foundations of Computational Health (FCHealth) HIIT programme: Veli Mäkinen (vice director), Ville Mustonen*
- *IFIP WG 2.10 Software Architecture: Tomi Männistö*
- *IFIP WG 6.1 Architectures and Protocols for Distributed Systems: Lea Kutvonen*
- *IFIP WG 5.8 Enterprise interoperability: Lea Kutvonen (vice chair)*
- *Finnish Committee for Research Data: Petri Myllymäki*
- *ESFRI Strategy Working Group for Data, Computing and Digital Research Infrastructures (SWG DIGIT): Petri Myllymäki*
- *Working group in "Digitalization and AI " of the Ministry of Education and Culture: Petri Myllymäki (chair)*
- *Steering group of the "Data and Computing 2021" development programme of the Ministry of Education and Culture in 2017-2021: Petri Myllymäki (deputy)*
- *Finnish Academy of Technology: Petri Myllymäki*
- *Steering group of the research programme on Novel Applications of Artificial Intelligence in Physical Sciences and Engineering Research (AIPSE) of the Academy of Finland in 2018-2021: Petri Myllymäki (expert member)*
- *Scientific advisory board for national defence (MATINE): Sasu Tarkoma*
- *Business Finland 5th Gear Research Programme Steering Group: Sasu Tarkoma*
- *Scientific Computing Forum: Petri Myllymäki (chair)*
- *The Finnish Society for Computer Science (TKTS): Mikko Koivisto (chair)*

5.   *Department statistics 2018*

Various indicators can be used to describe the situation in staff, finances, teaching, and research at the department in 2018. The changes and developments in the different areas are better described by comparing these numbers to those of previous years.

5.1. Staff

In 2018, a total of 165.0 person-years was completed at the department, which is 0.6 person-years less than the previous year. The number of teaching and research staff decreased from the previous year by 6.0 person-years to 121.5 person-years, whereas the number of other staff increased by 5.4 person-years to 43.5 person-years. Among the teaching and research staff, it was especially the number of associate and assistant professors that increased in number, while the numbers of doctoral students and teaching assistants decreased from 2017. Whereas the work carried out by associate and assistant professors was 3.6 person-years, this number in 2018 was 7.2 person-years. The number of person-years completed by doctoral students, in turn, decreased from 52.0 person-years to 46.8 person-years, and the number of person-years completed by teaching assistants from 8.7 person-years to 3.3 person-years. Despite this decrease in the number of person-years completed by doctoral students, the doctoral students still covered over 38.5% of all person-years carried out by teaching and research staff. Among other staff, the number of person-years carried out by research and teaching assistants increased remarkably from 35.2. to 40.0 person-years.

The department staff has become increasingly international during the previous years, but in 2018 this development stopped at least temporarily. By the end of 2018, the percentage of foreigners among teaching and research staff was 36.3%, and among the whole staff 32.8%. Both these percentages are lower than in the previous year, when the corresponding percentages were 38.2 and 34.8. Despite this, the internationalisation of the department has been fast, as in 2012 the share of foreign employees among teaching and research staff was 20.00% and among the whole staff 18.18%.

The high number of males working in the area of computer science can also been in the gender balance at the department, as the percentage of female staff members in 2018 was only 15.3% of the person-years. From 2017 (18.2%) the decrease was 2.9 percentage points, and compared to 2015 when the percentage of females was at the highest (21.8%), the decrease was in total 6.5 percentage points.

The person-years completed on internal funding decreased by 1.0 person-year to 80.5 person-years, while the person-years on external funding increased by 1.2 person-years to 85.3 person-years. The most important sources of external funding counted in person-years were the Academy of Finland (47.4 person-years) and Business Finland (21.6 person-years). The biggest changes in externa funding compared to the previous year were the increase of 3.1 person-years in direct EU funding to 6.4. person-years, and the decrease of other international funding from 2.4 person-years to zero.

Person-years per staff category

	2014	2015	2016	2017	2018
Teaching and research staff	**152.9**	**163.4**	**148.9**	**127.5**	**121,5**
Professors	12.9	13.3	10.9	10.6	10.5
Research directors	0.0	0.3	0.6	0.4	0.4
Associate and assistant professors	2.0	2.4	3.0	3.6	7.2
University lecturers, lecturers	15.5	14.8	13.5	11.5	11.6
Researchers (academy researchers, university researchers, senior researchers, research coordinators)	7.6	10.4	10.1	11.4	12.8
Postdoctoral researchers	24.5	25.3	22.9	28.3	27.9
University teachers	1.4	2.0	2.0	1.0	1.0
Doctoral students	36.6	44.4	43.8	52.0	46.8
Research support staff, project researchers (*)	43.7	40.8	34.8	0,0	0.0
Other teaching and research staff (part-time teachers, project planners)	8.7	9.6	7.3	8.7	3.3
Other staff	**15.8**	**14.7**	**8.2**	**38.1**	**43.5**
Research and teaching support staff (**)	0.0	0.0	0.0	35.2	40.0
Administrative staff	8.0	7.5	3.2	1.0	1.0
IT staff	7.8	7.0	5.0	1.9	1.9
Other (trainees)	0.0	0.2	0.0	0.0	0.6
Total	**168.7**	**178.1**	**157.1**	**165.6**	**165.0**

* Starting in 2017, research and teaching assistants were categorised among teaching and research support staff among other staff.
** Research and teaching assistants categorised on the 1st tier of teaching and research staff before 2017.

Gender of staff

	2014	2015	2016	2017	2018
Female (% of person-years)	20.3	21.8	17.55	18.2	15.3
Male (% of person-years)	79.7	78.2	82.45	81.8	84.7

Foreign employees

	2014	2015	2016	2017	2018
Percentage of staff	32.4	31.8	33.1	34.8	32.8
Percentage of teaching and research staff	35.5	35.0	33.7	38.2	36.3

Person-years per funding source

	2014	2015	2016	2017	2018
Internal funding	**100.6**	**99.5**	**77.0**	**81.5**	**79,7**
Allocated funding (incl. HIIT)	76.4	83.9	66.8	72.8	68.1
Graduate schools, CoEs and performance-based funding	24.2	15.6	10.2	8.7	11.6
External funding	**68.1**	**78.6**	**80.1**	**84.1**	**85.3**
Academy of Finland	13.8	27.9	32.9	45.7	47.4
Business Finland	30.9	25.3	19.2	20.3	21.6
Finnish companies	2.9	6.7	6.2	3.3	6.4
EU funding	10.8	11.9	9.6	2.4	0.0
Other international funding	6.2	4.6	6.7	6.9	5.5
UH foundations	1.2	0.0	0.0	0.0	0.0
Other funding	2.2	2.2	5.5	5.5	4.5
Total	**168.7**	**178.1**	**157.1**	**165.6**	**165.0**

* Situation 31.12.2018

5.2. Funding

In 2018, the total funding of the department was MEUR 13.17. It increased with 1.03 Million Euros from the previous year. Internal funding increased by MEUR 0.74 and external funding by MEUR 0.29. Most of the funding was spent on staff expenses and facilities.

In 2018, external funding of the department was MEUR 7.42. The funding from EU increased by MEUR 0.27, whereas the funding form the Academy of Finland fell by 0.21 Million Euros. The funding from Business Finland increased by MEUR 0.03. In addition, the shares of national corporate funding, international funding and other funding increased slightly increased from the previous year, in all together by 0.20 Million Euros.

Besides being important financially for the department, the external funding is also an indicator of the department's competitive edge. However, when external funding makes up a large part of the department's funding while projects run for shorter periods of time, it brings insecurity especially to long-term planning.

Total funding and external funding (Million Euros)

	2014	2015	2016	2017	2018
Internal funding	**6.77**	**6.67**	**5.43**	**5.01**	**5.75**
Allocated funding (incl. HIIT)	5.44	5.73	4.60	4.01	4.85
Graduate schools, CoEs and performance-based funding	1.33	0.94	0.83	1.00	0.90
External funding	**5.42**	**6.24**	**6.48**	**7.13**	**7.42**
Academy of Finland	1.09	2.39	2.94	4.54	4.33
Business Finland	2.61	2.12	1.61	1.40	1.43
Finnish companies	0.17	0.51	0.56	0.17	0.22
EU funding	0.81	0.85	0.76	0.29	0.56
Other international funding	0.45	0.29	0.41	0.57	0.61
UH foundations	0.06	0.00	0.00	0.00	0.00
Other funding	0.25	0.08	0.20	0.16	0.28
Total	**12.19**	**12.91**	**11.91**	**12.14**	**13.17**

5.3. Teaching

The department's customary successes in game programming continued even this year. Our programming team 'Ukkonen fan club' took the 14th place in the ICPC 2018 World Finals held in Beijing. The placement was excellent as there were a total of 140 competing teams in the contest (https://icpc.baylor.edu/community/results-2018). The team consisted of students Hannes Ihalainen, Kalle Luopajärvi, and Antti Röyskö, supervised by Tuukka Korhonen.

In 2018, no new record was made in the number of the credits produced. However, the teachers of the department still produced almost 50 000 credits, which means in average over 1 400 credits per teacher.

The number of completed Bachelor's degrees was highest during the observation period; the 113 degrees clearly exceeded the goal of 100 degrees. In 2018, the number of Master's degrees still fell short of the goal, even though it increased by 5 compared to the previous year.

Number of students

	2014	2015	2016	2017	2018
Main admissions	130	130	130	130	130
Accepted main admissions	158	143	119	141	146
Accepted international	22	17	29	21	22
All students	1 727	1 688	1 736	1 577	1 714

Teaching and credits

	2014	2015	2016	2017	2018
Teacher person-years	40.5	42.1	36.7	35.4	34.4
Credits total	45 590	50 394	48 824	50 422	48 224
Credits per person-years	1 126	1 197	1 330	1 424	1 402

Number of degrees

	2014	2015	2016	2017	2018
Bachelor's degrees	76	80	93	104	113
Master's degrees	51	63	83	56	61
Licentiate degrees	1	-	-	-	-
Doctoral degrees	8	6	6	6	7

5.4. Research

During the year under review, 2018, research at the department focused on four main fields; algorithms. artificial intelligence, networks, and software. As in previous years, the results from all these research fields were actively discussed in writing in 2018. In 2018, researchers at the department published 232 refereed articles and a total of 261 publications. This means the number of publications grew significantly compared to the previous year.

Researchers from the department continued to participate in various conference programme committees and the editorial staff of journals, as well as acting as referees to articles, during 2018. Further, some researchers acted as chair of programme committees and editors of special issues of scientific journals. Researchers from the department were also invited speakers at international conferences and other events.

International mobility is very significant in research. Thus, researchers at the department made several longer or shorter research visits to universities and scientific institutes abroad in 2018.

In 2018, the research of the department was more visible in public media both nationally and internationally than in the previous years. The most significant media attention during this year was received by the MegaSense programme, a multidisciplinary approach for developing methods for air quality monitoring in megacities. From the Department of Computer Science, Professor Sasu Tarkoma with his group participates in this programme. The group's task in the programme is to study new network technologies and their use, and the aim is to build a new kind of air quality sensor network and to find ways for more intelligent management of the sensors. Other topics that received media attention were the Finnish Center for Artificial Intelligence FCAI and its research topics, presented in the media, for example, by Assistant Professor Arto Klami, the research of Professor Hannu Toivonen's group on computational creativity, Assistant Professor Michael Mathioudakis' research on polarisation of social media, and Post-doctoral Researcher Eemil Lagerspetz's research on usage of mobile applications.

In addition to research, also two MOOC courses gained visibility in the media: Cyber Security MOOC which was developed together with F-Secure Cyber Security Academy and which is in the charge of Postdoctoral Researcher Samu Varjonen, and Elements of AI, which is an artificial intelligence course created together with Reaktor Oy as a course to people from a wide range of backgrounds, and which is in the charge of Associate Professor Teemu Roos.

In 2018, the department and its staff also gained recognition from other sources. In the Times Higher Education assessment of 2017-2018, the department was ranked 93rd of all the computer science departments in the world, 34th among European, and 4th among Scandinavian departments. The international IEEE organization, in turn, awarded Professor Pan Hui with the esteemed title IEEE Fellow in 2018. Two conference papers and one journal paper from the department received honourable mention. Among former doctoral students of the department, Jeremias Berg received the PhD thesis award from the Doctoral School in Natural Science for his thesis Solving Optimization Problems via Maximum Satisfiability: Encodings and Re-Encodings. Hans Liljestrand received the MSc thesis award from Tietoturva ry (the Finnish Society for Information Security) for his thesis Linux Kernel Memory Safety.

Refereed and other publications 2018

	2014	2015	2016	2017	2018
Refereed journal articles (A1)	75	72	69	65	88
Refereed conference and compilation articles, reviews (A2-A4)	113	114	108	132	144
Other publications (all other categories)	39	39	38	34	29
Total	**227**	**225**	**215**	**231**	**261**

All publications 2018 according publication types

Publication type	2014	2015	2016	2017	2018
A1 Refereed journal articles	75	72	69	65	88
A2 Reviews in scientific journals	0	3	2	1	2
A3 Contributions to books/other compilations (refereed)	3	8	3	4	8
A4 Articles in conference publication (refereed)	110	103	103	127	134
B1 N*on*-refereed journal articles	8	5	5	1	7
B2 Non-refereed book chapters	6	4	1	1	2
B3 Non-refereed articles in conference proceedings	0	5	10	4	4
C1 Scientific books	2	1	0	1	0
C2 Edited books. compilations. conference proceedings or special issues of journals	9	6	5	3	3
D1 Articles in professional journals	0	1	1	3	0
D2 Articles in professional manuals. guides. professional information systems or text book material	0	0	0	5	0
D3 Articles in professional conference proceedings	0	1	4	1	0
D4 Published development or research reports	5	1	0	0	0
D5 Text books. professional handbooks. guidebooks or dictionaries	0	0	1	0	0
D6 Edited professional books	0	0	0	0	2
E1 Popular contributions to journals. books or other compilations	1	0	1	1	0
E2 Popular monographs	1	0	0	1	0
F2 Public contributions to artistic work	1	2	0	0	0
F3 Public artistic plays or exhibitions	1	0	0	0	0
G3 Licentiate theses	1	0	0	0	0
G4 Doctoral theses. monographs	0	2	2	0	1
G5 Doctoral theses. article-based	4	5	4	6	6
H1 Granted patents	0	0	0	1	4
I1 Audio-visual material	0	0	0	1	0
I2 ICT programs or applications	0	6	4	5	1
Total	**227**	**225**	**215**	**231**	**261**

As in previous years, the staff of the department received many different awards and recognitions in 2018.

6.1. Awards given by the Department of Computer Science

The Department of Computer Science has given some annual awards to its staff members since 2001. During the [Department's Christmas Coffee for staff](), these awards for 2018 were given to the following persons:

- *Junior Teacher Award: Research Assistant Henrik Nygren*
- *Junior Researcher Award: Doctoral Student Leo Leppänen*
- *Senior Teacher Award: University Lecturer Matti Luukkainen*
- *Senior Teacher Award: Assistant Professor Indrė Žliobaitė*
- *Person of the Year Award: Associate Professor Teemu Roos*

Staff members giving and receiving the annual awards 2018:
Antti-Pekka Tuovinen (left), Veli Mäkinen and Sasu Tarkoma as well as
Teemu Roos, Indrė Žliobaitė, Leo Leppänen and Henrik Nygren.
Photographer: Petri Kutvonen

6.2. Awards and recognitions given to the Department and its staff or students

- *Awards related to publications:*
  - *Sezin Yaman and Tommi Mikkonen together Riku Suomela received the Distinguished Paper Award of the EUROMICRO Software Engineering and Advanced Applications (SEAA 2018) Conference for their article Continuous Experimentation in Mobile Game Development.*
  - *Fabian Fagerholm together with Daniel Graziotin. Xiaofeng Wang and Pekka Abrahamsson received the 2018 Best Paper Award of the Journal of Systems and Software for their article What happens when software developers are (un)happy.*
  - *Kari Rantanen received the BayesFusion Best Student Paper Award of the Probabilistic Graphical Models (PGM 2018) Conference for his article Learning Optimal Causal Graphs with Exact Search, written together with Antti Hyttinen and Matti Järvisalo.*

- *Thesis awards:*
  - o *Jeremias Berg got the Doctoral School in Natural Sciences outstanding doctoral dissertation award 2018 for this doctoral thesis Solving Optimization Problems via Maximum Satisfiability: Encodings and Re-Encodings.*
  - o *Hans Liljestrand, a student of the Master's Programme in Computer Science got the master's thesis award of the Finnish Society for Information Security for his master's thesis Linux Kernel Memory Safety for the most distinguished master's thesis in information security done in 2018.*

- *Awards and recognitions related to teaching and studies:*
  - o *The programming team Ukkonen fan club consisting of computer science students (Hannes Ihalainen. Kalle Luopajärvi and Antti Röyskö, supervised by Tuukka Korhonen) placed 14th in the ICPC 2018 World Finals with 140 contesting teams from all over the world.*

- *Other awards and recognitions:*
  - o *Professor Pan Hui received the esteemed title IEEE Fellow in 2018.*

Defences of Doctoral Theses

09.01.2018   M.Soc.Sci., B.Sc. Matti Nelimarkka: *Performative hybrid interaction: Understanding planned events across collocated and mediated interaction spheres*

26.02.2018   M.Sc. Ella Peltonen: *Crowdsensed Mobile Data Analytics*

01.03.2018   M.Sc. Oswald Barral: *Textual Information using Physiological Signals*

22.03.2018   M.Sc. Ilkka Kosunen: *Exploring the Dynamics of the Biocybernetic Loop in Physiological Computing*

25.05.2018   M.Sc. Jeremias Berg: *Solving Optimization Problems via Maximum Satisfiablity: Encodings and Re-Encodings*

15.06.2018   M.Sc. Joel Pyykkö: *Online Personalization in Exploratory Search*

21.12.2018   M.Sc. Lidia Pivovarova: *Classification and Clustering in Media Monitoring: from Knowledge Engineering to Deep Learning*

Events of the educational programmes

12.01.2018   Computer Science Colloquium
19.01.2018   Data Science Fest
09.03.2018   Teacher's Day of the Master's Programme in Data Science
16.03.2018   Data Science Fest
20.04.2018   Data Science Fest
04.05.2018   Data Science Fest
15.05.2018   Computer Science Colloquium
07.09.2019   Data Science Fest
14.09.2018   Computer Science Colloquium
12.10.2018   Data Science Fest
16.11.2018   Computer Science Colloquium
23.11.2018   Data Science Fest
13.12.2018   Data Science Christmas Coffee
17.12.2018   Teacher's Day of the Master's Programme in Computer Science

Scientific conferences and meetings

16.-17.05.2018   *The 4th Workshop on Data Structures in Bioinformatics*

Staff meetings and events

27.04.2018   *Perjantaipulla (Friday coffee)*

18.05.2018   *Perjantaipulla (Friday coffee)*

24.05.2018   *Strategy seminar in Korpilampi*

01.06.2018   *Perjantaipulla (Friday coffee)*

08.06.2018   *Perjantaipulla (Friday coffee)*

19.06.2018   *Summer event in the terrace of Exactum*

16.08.2018   *Department summer trip to Tallinn*

31.08.2018   *Perjantaipulla (Friday coffee)*

28.09.2018   *Perjantaipulla (Friday coffee)*

23.11.2018   *Perjantaipulla (Friday coffee)*

30.11.2018   *Department pre-Christmas party*

13.12.2018   *Torstaipulla (Thursday coffee)*

18.12.2018   *Department Christmas coffee*

Other events

13.04.2018   *Farewell seminar of Emeritus Professor Esko Ukkonen*

29.05.2018   *Helsinki Centre for Data Science (HiData) kick-off event*

06.09.2018   *Graduation ceremony of course Elements of AI*

25.09.2018   *Drones in Urban Environment*

The farewell seminar of Emeritus Professor Esko Ukkonen was held in Exactum on 13 April 2018.
Photographer: Susan Heikkinen

Department steering group

11.1.2018, 23.1.2018, 20.2.2018, 20.3.2018, 24.4.2018, 8.5.2018, 5.6.2018, 14.8.2018, 11.9.2018, 2.10.2018, 23.10.2018, 13.11.2018 and 18.12.2018

Board of the Bachelor's Programme in Computer Science

16.1.2018, 14.2.2018, 15.3.2018, 22.5.2018, 11.9.2018, 2.10.2018, 30.10.2018 and 27.11.2018

Board of the Master's Programme in Computer Science

30.1.2018, 27.2.2018, 27.3.2018, 24.4.2018, 29.5.2018, 26.6.2018 (e-mail meeting), 18.9.2018, 16.10.2018, 13.11.2018 and 4.12.2018

Board of the Bachelor's Programme in Data Science

6.2.2018, 6.3.2018, 10.4.2018, 8.5.2018, 5.6.2018, 25.-27.6.2018 (e-mail meeting), 25.9.2018, 23.10.2018, 20.11.2018 and 13.-18.12.2018 (e-mail meeting)

Board of the Doctoral Programme in Computer Science

15.2.2018, 2.3.2018, 7.-15.3.2018 (e-mail meeting), 20.4.2018, 15.5.-4.6.2018 (e-mail meeting), 21.-24.8.2018 (e-mail meeting), 21.9.2018 and 2.11.2018