

2015 mini-annual report

Department of Computer Science

2015 has been a great year for the Department of Computer Science. Again, we have had a record-breaking admission of new undergraduate students, in addition to a record number of graduates from the master's degree programmes in computer science and IT. Our graduates are in high demand, and they can easily get interesting and challenging jobs. The computer science degree programmes (Bachelor's and Master's) were positively accredited. Yet, the Accreditation Council pointed out that we, to an even greater extent, should seek to reduce drop-out rates of students, and thus we have implemented a number of initiatives for this exact purpose. In terms of research, 2015 was also a great year. Among other things, we have received two ERC grants as well as an EliteForsk Award, and we have successfully organised several international conferences and summer schools at the department.

Staff

In 2015, there have been the following changes in our tenured staff:

- Peyman Afshani has been employed as Associate Professor in the Algorithms and Data Structures research group from March 16.
- Sofia H. Rasmussen has been employed as Research Group Coordinator from November 1.
- Among the administrative staff, Louise Mejnerts, Tina Rudolph, Ann Eg Mølhave, and Sarah Ølholm Eaton have resigned during the course of 2015.

Awards and appointments

- Ivan Damgård: ERC Advanced Grant and RSA 2015 Conference Award for Excellence in Mathematics.
- Anders Møller: ERC Consolidator Grant.
- Lars Birkedal: Ministry of Higher Education and Science's EliteForsk Award.
- Susanne Bødker: EUSSET Lifetime Achievement Award.
- Lars Arge: Member of the Presidium of the Royal Danish Academy of Sciences and Letters and Knight of the Order of Dannebrog.
- Kaj Grønabæk: Member of the Danish Academy of Technical Sciences (ATV).
- Michael E. Caspersen: Member of ACM Education Council.
- Two teams from the IT Product Development programme: First and second place at the international competition FutureHacks IOT Hackathon in Madrid.
- Kenneth Sejdenfaden Bøgh and Tobias Sonne: The Stibo-foundation's travel grant.

Research projects

The department receives approximately DKK 40 million a year in external research grants. Larger grants starting in 2015:

- Better MPC Protocols in theory and in practice, Ivan B. Damgård, EU H2020 ERC, DKK 18 million.
- Program Analysis for Advanced Web Applications, Anders Møller, EU H2020 ERC, DKK 14.7 million.
- Center for Computational Thinking, Lars Birkedal and Michael Caspersen, IT-Vest, DKK 3.4 million.
- Automated Verification for Concurrent Programs, Thomas Dinsdale-Young, the Danish Agency for Science, Technology and Innovation (DFF), DKK 1.8 million.
- Program Logics for Relaxed Memory Models, Kasper Svendsen, the Danish Agency for Science, Technology and Innovation (DFF), DKK 1.8 million.
- Future Cropping, Ira Assent, Innovation Fund Denmark, DKK 1.4 million.
- CryptoAction2, Claudio Orlandi, COST EU Network, DKK 1.3 million.
- Transferring linear programming techniques to flow problems and game theoretic extensions, Thomas Dueholm Hansen, the Carlsberg Foundation, DKK 1.25 million.
- EliteForsk Award, Lars Birkedal, Ministry of Higher Education and Science, DKK 1.0 million.
- Microsoft PhD grant, Marianne Graves Petersen, DKK 0.7 million.
- World Robot Olympiad, Søren Poulsen, UVM and private foundations, DKK 0.6 million.
- Dynamic Flood Risk Map, Lars Arge, Realdanias 'Klimaspring' campaign.
- Denmark-Korea collaboration, Peyman Afshani, Danish Agency for Science, Technology and Innovation, International Network Program.

Conferences, workshops and summer schools

During 2015, the department has arranged the following events:

- Katrinebjerg career day, May 8 (Søren Poulsen).
- MADALGO Summer School on streaming Algorithms, August 10-13 (Kasper Green Larsen).
- Critical Alternatives, August 17-21 (Olav Bertelsen).
- 7th workshop on Massive Data Algorithmics, part of ALGO 2015, September 14-18 (Kasper Green Larsen).
- Workshop on Quantum Cryptography and Quantum Information, October 19-22 (Ivan Damgård).
- Privacy/Security/Identity@AU, October 28 (Susanne Bødker).

In addition, the department's employees have participated in numerous conferences, workshops, summer schools, and meetings all over the world.

Research Dissemination

The department has arranged the following Friday Lectures with both local and external researchers:

- *A basic introduction to linear programming and recent results about simplex algorithms* (Thomas Dueholm Hansen, local, Assistant Prof., Mathematical CS Group).
- *Verifying Concurrent Software* (Thomas Dinsdale-Young, local, Postdoc, Semantics Group).
- *Mining Genome Data to Predict Disease Risk* (Bjarni Vilhjámsson, local, Postdoc, BiRC).
- *Smart Cities, IoT and Security and Privacy needs* (Antonio Skarmeta, visiting Professor from Murcia).
- *From Shape-Changing Interfaces to Chameleon Objects* (Ted Selker, visiting Professor from UC Berkeley).
- *Algorithmic Game Theory – From Computational Complexity to Poker and Rainforests* (Branislav Bosansky, local, postdoc, Mathematical CS group).
- *It Is Hard to Believe that everything is Hard* (Allan Grønlund Jørgensen, local, Postdoc, Madalgo).
- *Current and future tools for designing molecular computation* (Rasmus Lerchedahl Petersen, Microsoft Research Cambridge).
- *Humanistic HCI and critical computing* (Jeffrey and Shaowen Bardzell, Indiana University).

Additionally, we held our annual Computer Science Day on which the department's research groups presented selected activities.

Dissemination and recruitment activities

Throughout the year, the department has organised a wide range of activities for students from upper secondary, primary and lower secondary schools all over the country. The activities are wide-ranging and were organised both locally at CS and in collaboration with ST, AU and other external partners. Among other things, we have arranged and/or been involved in events, such as:

- Study-related events:
 - u-days
 - Student internships for upper secondary school students
 - On-the-job training for primary and secondary school students
 - Visits from upper secondary school classes and primary school classes
 - The "Rullende universitet"
 - Student for a day
 - Sub-University AU
- Competitions and camps:
 - World Robot Olympiad 2015, www.wrodenmark.dk
 - Co-organisers of First LEGO League Aarhus
 - IT-Camp for girls, www.itcamp.dk
- Focused talent development programs:
 - Student guidance for upper secondary students in connection with study projects
 - Themes about Cryptology for master class in Mathematics
 - Visit from the Academy for Talented Youth

- Research dissemination to the general public:
 - Workshop and project demonstration at Aarhus Mini maker faire 2015.
 - Lectures on Big Data at the Danish University Extension.
- Dissemination and further education of student teachers:
 - Workshops for the students at Aarhus teachers' college on the science and technology programme.
 - Course in technology-based teaching development for didactics/CUDIM students.
 - Workshop, for teachers from Campus Grindsted, about the development of robot-based teaching in natural sciences at upper secondary level.

During 2015, we have had more than 800 visitors for events at the department. A great thank you to the PR committee and all others involved in the great work of communicating and sharing information about our study programmes.

Student associations

The department's two very well-functioning student associations (DSAU and SOFA) actively contribute to creating one of the country's best study environments for our approx. 1,000 students. Among their many excellent activities are:

- Students from the department participated in this year's Danish championship in programming, and subsequently in the North-Western European championship in Linköping.
- "Coding Pirates" coaches for 3-8 grade students at lower secondary schools.
- Spare-Time Teaching where students organise weekly academic presentations and social events: sparetimeteaching.dk.

Study programmes

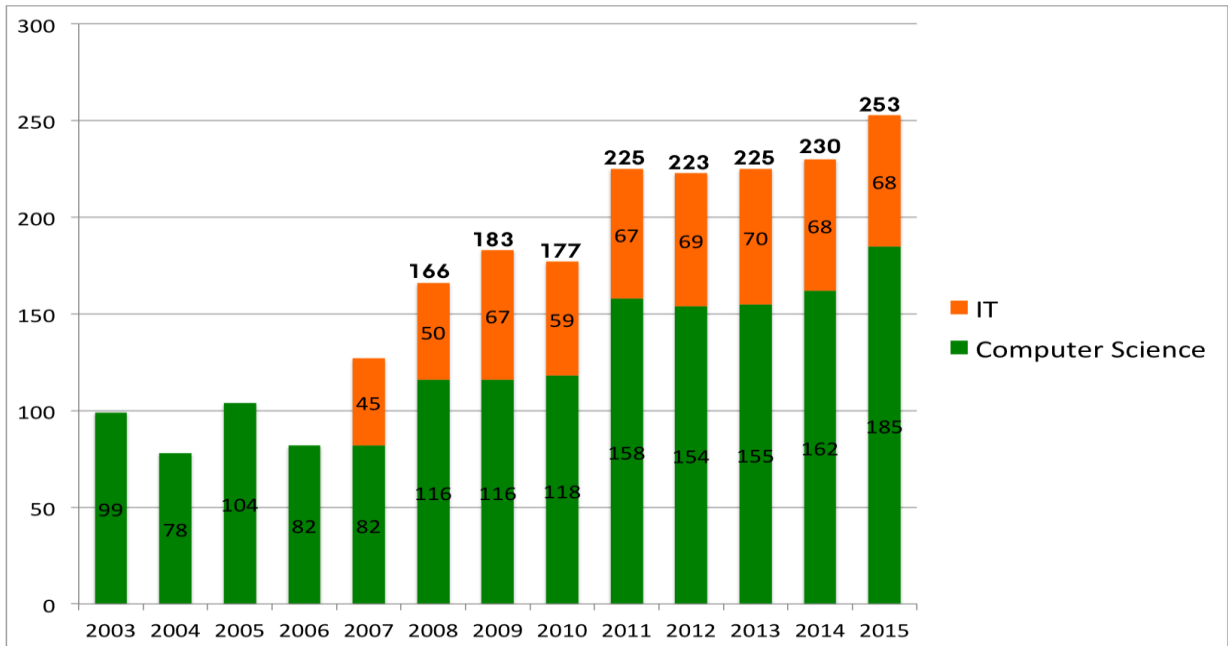
The department has two Bachelor's degree programmes, two Master's degree programmes, a diploma degree programme and an executive Master's degree programme (within further and continuing education) as well as a PhD degree programme. In 2015, the department passed two important milestones: PhD number 250 graduated as well as the 50th master of IT product development graduated.

As in previous years, the department's students have elected teacher of the year. There were five nominees:

- Aslan Askarov
- Niels Olof Bouvin
- Susanne Bødker
- Ole Caprani
- Michael Caspersen

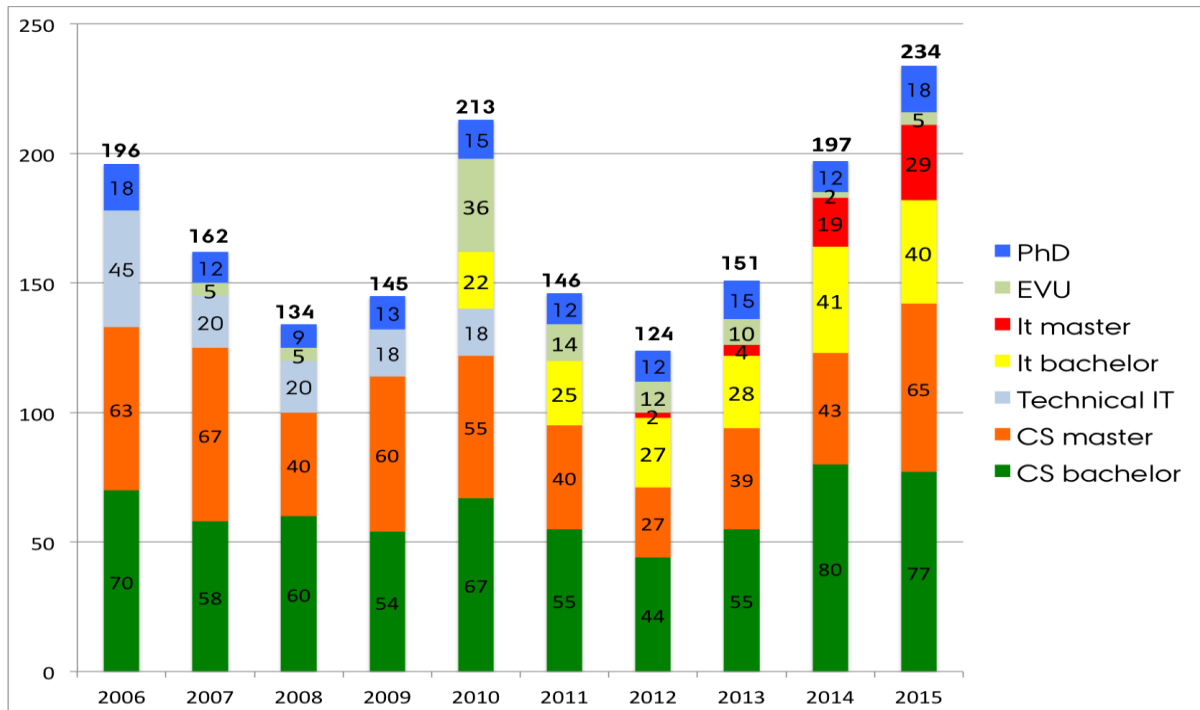
The winner was Niels Olof Bouvin based on the following grounds: *"With an extraordinary knowledge and commitment, Niels Olof Bouvin is able to present the syllabus in a humorous and convincing manner."* In addition, there have been elections for student teacher(s) of the year and student of the year. These distinctions were awarded to Mathias Rav, Daniel Graungaard and Kasper Sacharias Roos Eenberg respectively.

As illustrated below, the department has proven successful in maintaining the very high level of admissions to our two bachelor's degree programmes. Almost 20% of all new science bachelor students admitted to Aarhus University are enrolled at department of Computer Science.



The IT study programme has restricted access of 70 students per year.

During 2015, the department has produced the following number of degrees:



Through "Datalogisk Uddannelsesforum"(DUF) the department has close contacts and cooperation with student organisations for computer science and IT, which will launch numerous initiatives to improve our study environment and degree programmes.

Lars Birkedal
Head of department