

Mini-annual report, Computer Science, 2009

It is with great pleasure that I once again can observe, that the past year has been extremely successful and produced growth and prosperity in many different areas. Despite its relatively small number of academic staff the department is once again able to assert itself in the top of all the three areas that we deal with: research, teaching, dissemination and collaboration with the industry and public organizations. I would hereby like to extend a huge thank to all employees. It is because of you and your efforts that the Department is performing brilliantly.

Growth in many areas

From 2006 to 2009 the intake at our two bachelor degrees has increased from 82 to 183, and the department now has almost a quarter of all the faculty's undergraduate students. At the same time the intake of women has tripled. It is an encouraging development and we continue our efforts to reach out to girls in high schools and primary schools, among other channels through the annual IT Camps for girls that the department arrange each year in the autumn holiday.

The department now has two full-time education coordinators, Søren Poulsen and Karina Svanborg. Their main task is to improve conditions for our students. With nearly a thousand students they have plenty to do. Over the year a detailed analysis of the study environment has been completed as a follow-up on the university's broader study investigation. The department is now implementing a series of actions to help make the situation even better than it is today.

We put a lot of effort into publicizing the department's research and education. During the year we participate in more than 20 different types of publicity, recruitment and dissemination events. In addition we have during the year issued "DATALOG Magasinet" which in a 100 pages describes a broad range of the department's activities. The magazine is issued in both Danish and English.

The physical expansion of IT Science Park continues. Stage 2 of Incuba Science Park is now complete and contains among other new classrooms for our students. At the same time the realization of the third stage of the IT parc has started. Design and tendering is well over, demolition and preparation of the site is ongoing, and the construction will soon begin. We look forward to the summer 2001, where we can start using the new buildings. They don't provide us with considerably more square meters, as we simultaneously vacate other areas. But they will mean that the department's students will get closer contact with our employees. This is particularly the case for master students who will get offices together with the research groups they are connected to. The new building will accommodate a 250-man's auditorium, which means that it will be possible to place the major courses in the IT city in the future.

At the end of 2011 the Engineering College of Aarhus also moves all its electronic and IT activities to Katrinebjerg. We are looking forward to this. We have for almost 10 years collaborated with the Engineering College about the education of civil engineers within technical IT. With this physical move we expect that the cooperation will be extended to include joint research projects.

Academic staff

The department has a highly well-functioning VIP staff ranked in the top of all common parameters for the measurement of research and teaching – both when compared to other Danish computer science institutions and when compared across our own faculty. A study by the Ministry of Science, Technology and Development shows that computer science is the discipline in which Danish research is strongest measured by number of references per publication. Denmark occupies a splendid second place only outdone by the U.S.

The department's biggest problem is that we have too few permanent academic staff members. The department's strategic plan is to increase the number of permanent academic staff members from the current nearly 20 to approximately 30 over a period of 10 years. We would like more women and we would also like to have more foreigners and people from other Danish universities. The department has over the past 20

years on average lost a permanent academic staff member annually, primarily for professorships at other universities. This is a quality sign, but it also means that now, when we also have age-related retirements we must at least employ three to four new academic staff members a year if we are to achieve the growth that is so badly needed in order to maintain the department's position within both research and teaching.

- Thomas Skjødeberg Toftegaard has joined in the spring as a professor MSO (professor with special obligations) in Communication Technology at the Aarhus School of Engineering (ASE). Thomas is contributing to ensure a strong and good integration of the academic environment between the Department of Computer Science and Engineering College of Aarhus. He is responsible for the engineering education in technical IT.
- Morten Kyng has been appointed Professor of Pervasive Computing (an extension of a temporary mso-professorship within the same area).
- Olivier Danvy and Gerth Stølting Brodal have been promoted to associate professors MSK (lectures with specific skills).
- Marianne Graves Petersen has been appointed a senior lecturer within the field of interaction design.
- At the end of the year we posted four senior lecturer positions within respectively, cryptographic protocols, complexity theory, software architecture for mobile computing and algorithms and data structures. We expect to fill all four positions.
- Klaus Ostermann joined a professorship in Germany and is currently on leave from his post at the department.
- Søren Christensen has been transferred to the faculty, where he is head of the newly established joint IT unit. Søren has besides his research and teaching contributed significantly to the establishment of the excellent physical environment of the department in the IT city Katrinebjerg, as he has been the department's representative in all building committees. A job he has completed in an exemplary manner. Søren has promised to remain in this post until the third stage of the IT Parc is completed.
- Ole Østerby who celebrated his 40th anniversary last year becomes emeritus from 1st January 2010. Ole started his work at AU over 50 years ago and has every year made a major contribution both to research, teaching and administration. Ole will continue to come to the department several days a week.

Technical / administrative staff

At the administrative areas there has been several changes during the year. The areas of IT, web development and economy and much of HR and PhD have all been grouped under the faculty. The department welcomes this development. It will in our opinion lead to a rationalization as well as an improvement of the quality especially in areas where there have been small units with 1-2 employees.

Computer Science is with no doubt the department that is most heavily affected by the staffing changes since we take leave of more than 25 technical and administrative employees transferred to employment by the faculty. The majority of the employees will however still have jobs in the IT park and thus enter into the social life here.

On behalf of the department I would like to thank the employees with whom we must now take leave of. Most of them have been at the department for many years and thus contributed greatly to its development and success. We wish you well in your new job and trust that we will continue to have a close and fruitful cooperation with you.

- Annemette Hammer started at the turn of the year as secretariat director of the department. Annemette has in very short time established herself as an insightful and committed leader of the secretariat, and to a great extent it is thanks to her efforts that the large rapidly implemented changes at the secretariat has gone relatively smoothly.
- Karina Svanborg was in spring hired as education coordinator and is already working hard on improving the conditions for our many students.

- Sara Ølholm is employed as a maternity cover and takes care of the PhD – and Erasmus programs. After the end of the maternity cover Sara will continue in a newly created position where she among other will work for the Caretech project.
- The department has taken leave of office trainee Oksana Orlenko who has completed her education.
- Jan Frederiksen is employed as a new trainee.

Appointments, awards and competitions

- Lars Arge has been appointed as "Distinguished Scientist Member" by ACM. This honor is awarded researchers who have achieved significant results or have had significant influence within computer science. Previously, only a handful of Danish computer scientists have achieved ACM honorees.
- Erik Ernst has been awarded AITO's "Dahl-Nygaard Junior Prize 2010" for his contribution to object oriented programming.
- Anders Møller has been awarded a scholarship from Google at 450.000 DKR for his work on static analysis of JavaScript programs.
- Karen Johanne Kortbek has received a grant from Mr. Ferdinand Salling Memorial Fund to study abroad. She is affiliated the Center for Interactive Spaces, where she has worked with interaction design in connection with theaters, museums, festivals and other cultural related public spaces.
- Carsten Nørby and Christian P.V. Christoffersen have been awarded a scholarship from the Siemens Foundation to support their thesis, which aims to simulate the deformation and fragmentation of materials in 3 D visualization.
- The department of Computer Science attended by 21 students in DM in programming that took place at DTU. We had five teams among the ten best Danish teams. Subsequently, we participated with six students at the Northwest European championship in programming in Nuremberg, where we had a nice 16th place out of 64 teams – and was placed as the best Danish team

New projects

The department has external grants for 40 to 50 million DKK per year. This means that more than half of the funds for the department's work are external. In 2009 we have initiated or received authorization for the following major projects with external funding:

- Centre for Research in the Foundations of Electronic Markets, Ivan B. Damgaard, DSF, 12.0 million DKK.
- Care Tech Innovation, Morten Kyng, European Regional Fund, 5.0 million DKK.
- Confidential Benchmarking, Ivan B. Damgaard, FTP, 4.8 million DKK.
- New Cryptology, Ivan B. Damgaard, Villum Kann Rasmussen Foundation, 2.1 million DKK.
- Algorithmic for Distributed Management, Orestis Teletis, FNU, 1.7 million DKK.
- Your House, Jeppe Brønsted Rørbæk, European Regional Fund, 1.6 million DKK.
- UNITY - Interdisciplinary Network Center, Søren Poulsen, IT-Vest, 1.3 million DKK.
- Innovation Network for Information Sharing, Preben Holst Mogensen, FI, 0.8 million DKK.
- Female control design for advanced electronic products, Marianne G. Petersen EBST, 0.4 million DKK.

Workshops and summer schools

The department has over the year hosted the following events:

- 25th Annual Symposium on Computational Geometry (Lars Arge & Gerth Brodal Stølting).
- Workshop on Massive Data Algorithmic (Lars Arge & Gerth Brodal Stølting).

- 10th Workshop on Coloured Petri Nets and CPN Tools (Kurt Jensen).
- 9th Danish HCI Research Symposium (Olav W. Bertelsen).
- Symposium in connection with Mogens Nielsen's 60th birthday (Olivier Danvy).

In addition the employees of the department have as usual attended lots of conferences and meetings worldwide. Kaj Grønbæk and Marianne Graves Petersen attended the VTU's Green IT delegation to Shanghai, while many of the Turing building's employees participated in a DG event with the aim to strengthen the research cooperation between Denmark and China in the IT area.

As usual we have arranged a series of Friday lectures with a broad professional viewpoint:

- Stepwise Refinement Considered Harmful (Michael E. Caspersen).
- Inauguration talks of three professors
 - Making IT pervasive: Computing, Healthcare and User Innovation (Morten Kyng).
 - Deciding the Undecidable (Michael Schwartzbach).
 - Names in boxes and Dante in Purgatory (Peter Bro Miltersen).
- Virtualization will be the Operating System of the Cloud (Steffen Grarup. VMware).
- Software Process Improvement: Practice and Research (Peter Aksel Nielsen, Aalborg University).
- Enabling Geo-Spatial Context on the Mobile Internet (Christian S. Jensen, Aalborg University).
- Fluid Simulation and Control for Computer Graphics (Michael Bang Nielsen).
- Inauguration talk for mso-professor:
 - Next Generation Wireless Infrastructure (Thomas Skjødeberg Toftegaard).
- The Design of C++0x (Bjarne Stroustrup, Texas A&M University).
- Mobile and the Interplanetary Internet. Bundle Protocol on Earth and beyond (Vint Cerf, Google).
- Fault tolerance from a Cellular Biology Perspective (Caroly L. Talcott, SRI International).
- 50 years with the University of Aarhus – it was like this when grandpa was young (Ole Østerby).

Dissemination Activities

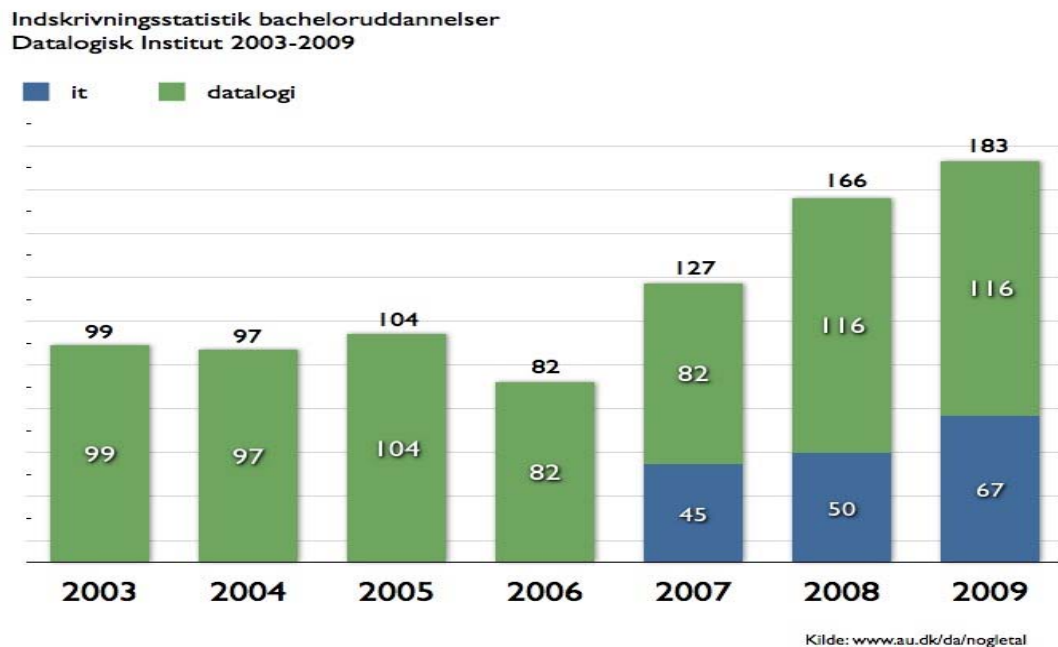
The department participates annually in a wide range of dissemination activities, which presents our research areas and our education. In 2009 we have among others been involved in:

- **Collaboration with secondary schools.** During 2009 the department has participated in a closer technical collaboration with secondary schools. Besides our regular visiting service we have been involved in the development of a new field of study at Langkær Gymnasium, as well as working with the new Science Center Sorø about science talent development. We also participate in the Faculty of Science's latest action "Det rullende universitet" where PhD students from the humanities and science visit colleges and take over teaching a full day, while teachers are away on seminars or the like.
- **World Robot Olympiad 2009.** The department organized together with UNF and DI ITEK the Danish qualification tournament for the international robot Olympiad for 16-19 year old high school students. The Danish finals were held in Søauditoriet where 150 high school students from across the country competed for seats in the finals in South Korea.
- **IT Camp for girls.** For the fourth consecutive year, the department arranged the IT camp for girls. 21 girls between 15 and 19 years had the opportunity to experience life as a student at the Department of Computer Science and were challenged in areas such as: programming, cryptography and audio and video production.
- The exhibition "**IT products for social interaction in the city's nightlife**" presented exam projects from an IT bachelor course. The projects ranged from dating and friends services at the nightclub to games in the queue, interactive lounge tables and informal and confidence-building installation in urban spaces.
- **Press and media.** During the year the department has been featured in many printed and digital media. For example in November DR2 broadcasted a feature on "GPS revolution" based on results from the Galileo project.

- **Computer Science Day 2009** where the department's research groups in 15 minutes presents "themselves" and their ongoing research activities. The event is annual and provides a compact overview of the research of the department and addresses both internally to employees at Katrinebjerg as well as to outsiders with an interest within computer science research.
- **Natur I teltet** is an annual event which takes place on the square in Aarhus Festival. This year visitors to the tent experienced students from the department demonstrate the @aGlance project from the Skanderborg Festival and hear about the departments education and research.

Teaching

The Department of Computer Science continues to increase the intake of new students at the two Bachelor programs. In 2009 we admitted 116 students to the bachelor's degree in computer science and 67 students to the bachelor's degree in IT. This means that we in a period of three years have more than doubled the number of new students. Measured over the past two years, the computer science bachelor has had an increase of 41%, while the IT Bachelor has had an increase of 49%. At the same time the number of women has tripled.



The IT Bachelor has during its first years marked itself as an attractive education that attracts many new students, in light of which the department has designed a master program to follow it up, which will be implemented from autumn 2010. This means that the department will continue to have two bachelor degrees (computer science and IT) and three graduate degrees (computer science, IT and technical IT). In addition the department offers diploma and masters courses within continuing education.

The department has over the year produced the following number of degrees:

- 13 PhDs
- 60 graduates (Master Sc.)
- 18 graduates (civil engineering)
- 54 Bachelors

The figures for PhD degrees are from the calendar year 2009 while the others are from the period October 2008 – September 2009.

Kurt Jensen
Head of Department