DIKU 2017

Strategy for the Department of Computer Science
at University of Copenhagen 2014 – 2017

CONTENTS

FOREWORD

In 2009, the Department of Computer Science (DIKU) published a strategy for the Department within the framework of the strategy for the University of Copenhagen, also known as Destination 2012. It set out the Department's vision and long-term objectives for the period 2009 – 2013. The strategy was ambitious and accompanied by an equally ambitious action plan containing 58 specific actions. Now, in 2013, we note that the Department has implemented nearly all 58 specific actions with positive results, thus having met the objectives for the previous strategy period.

The strategy for the Department of Computer Science for the period 2014 – 2017 as presented in the following is based on the new 2016 strategy for the University of Copenhagen as well as the faculty strategy SCIENCE 2016.

The past few years have been characterised by the merger of a number of other departments at SCIENCE. DIKU was not directly part of any merger. However, the Department's interdisciplinary work was strengthened in 2013 when the Centre for IT Innovation (CITI) became part of the Department of Computer Science. This provides exciting opportunities and impetus to further strengthen interdisciplinary research and education activities.

Together with the Department of Media, Cognition and Communication and the Centre for Language Technology, the Department of Computer Science formed the interdisciplinary Centre for Communication and Computing (CCC), with research and education activities in the field of IT and communication. Subsequently, the Royal School of Library and Information Science has become part of the centre. CCC was established in 2011, and in the coming strategy period, CCC will be included as a major player in the Department's strategy.

The guiding principle of the strategy until 2017 is targeted branding of the Department. During this strategy period, Management wants to make DIKU a brand that is renowned in the outside world and characterised by:
- excellent research – basic research and directly applied research
- challenging and socially relevant IT study programmes rooted in classical Computer Science and contributing to growth and development in Denmark.

A strong brand will be the best springboard for working with the challenges that the Department continues to encounter. These include attracting and retaining the best students in the computer science programme, attracting and retaining highly skilled researchers and attracting large and substantial research grants. A strong brand will help the Department achieve the other objectives contained in this strategy.

Enjoy reading!

Lisa Schultz, Head of Administration
Stephen Alstrup, Deputy Head of Department for Innovation and Business Collaboration
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Jakob Grue Simonsen, Deputy Head of Department for Research
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INTRODUCTION, VISION AND OVER-ALL OBJECTIVES

INTRODUCTION

This strategy, DIKU 2017, has been prepared within the framework of the overall 2016 strategy for the University of Copenhagen and the strategy for the Faculty of Science, also known as SCIENCE 2016. It has been prepared by the Department's management team in dialogue with all employees and with input from the Department Council composed of representatives from the Department's various employee groups and representatives of the students on the programmes under SCIENCE, which the Department offers in collaboration with other departments under the Faculty of Science. The other standing committees of the Department have contributed as well.

In addition to this introduction, the strategy includes a description of the challenges the Department is facing in 2013 and is likely to face in the years until 2017. Furthermore, the strategy contains seven chapters describing the Department's overall objectives aiming to address the said challenges and to help the Department gain an even stronger position in the field of computer science research and education.

VISION

As society becomes increasingly digitalised, all citizens need IT skills – in short, digital literacy. Data is considered by many as the future raw material, and businesses and public authorities are already struggling with the challenge of handling "big data". The demand for graduates with strong IT skills is increasing significantly and educational institutions find it difficult to keep up.

In this light, the Department has developed this vision for 2017 – focusing on development, cooperation and growth as key components:

Brilliant DIKU
- is recognised for educating graduates with fundamental knowledge at the highest international level, combined with practical and innovative competencies
- has a research profile that supports its education activities and conducts world-class research in selected Computer Science areas

Bold DIKU
- is known for its experimental, open and collaborative culture
- has a range of collaboration activities at SCIENCE and the University of Copenhagen, plus well-established joint research and education activities involving companies and public institutions

Big DIKU
- is a renowned brand with a strong identity – an influential player that contributes to setting the IT agenda at University of Copenhagen, as well as in a Danish and European societal context
- has growth as a goal in order to match society's increasing demand for graduates with strong IT skills and companies' need for IT research and IT innovation.

General quantitative objectives
The following chapters set out a number of quantitative objectives that will contribute to realising the Vision. Furthermore, the Department wants to achieve the following overall quantitative objectives:

Quantitative objective	Reference (2013)[1]	Target (2017)
Basic and education revenue	DKK 39.9 million	DKK 50 million
Revenue from external research funding (including overhead)	DKK 28.3 million	DKK 50 million
Graduates with a Bachelor's degree in computer science/ interdisciplinary IT programmes	80 / 52 Graduates	100 / 145 Graduates
Graduates with a Master's degree in computer science/ interdisciplinary IT programmes	60 / 30 Graduates	90 / 105 Graduates
Student FTE (full time equivalents) revenue	360 student FTEs	500 student FTEs
Major research projects (DIKU's share min. DKK 7 million, including overhead)	3 ongoing projects	6 ongoing projects

GRAND COALITION FOR DIGITAL JOBS
Since 2002, the European Commission has assessed the employment situation in the field of ICT in Europe and has found a significant demand for skilled ICT labour. In March 2013, President of the European Commission, José Manuel Barroso, invited all relevant parties from the industry, governments and the educational sector to join forces in a joint initiative, a "Grand Coalition for Digital Jobs", aiming to help meet the increasing demand for skilled labour. The background to the initiative is an anticipation that in 2015, 900,000 ICT jobs will be vacant in Europe. The President states that the number of ICT jobs increases by 100,000 every year and that the number of new graduates does not increase in line with the number of jobs.

Source: http://ec.europa.eu/digital-agenda/en/grand-coalition-digital-jobs-0

[1] Reference figures for 2013 are estimates based on Q1 and Q2 figures

CHALLENGES

Geographical separation

The Department of Computer Science has collaboration and contact with several other departments at SCIENCE as well as departments and centres at other faculties of the University of Copenhagen. These activities are deeply rooted in research and education activities in areas as diverse as humanities, health and science. The breadth of the Department's activities constitutes both an advantage and a challenge for the Department which, despite the widespread collaboration with researchers in other disciplines, has a common point of reference in Computer Science disciplines.

The academic breadth is also underlined by a geographical separation as the Department has locations on both the North Campus as a basis for working with departments under the Faculty of Science and the Faculty of Health and Medical Science, and on the South Campus as the basis for collaboration with departments and centres under the Faculty of Humanities. This geographical separation poses both practical and organisational challenges, and also weakens the Department's ability to maintain a collective professional identity and a social community among employees who would like to see the Department physically united.

Organisational barriers at University of Copenhagen

During the previous strategy period, the Department of Computer Science worked diligently to forge links with other disciplines at University of Copenhagen and to conclude specific collaboration agreements with other academic environments covering both research and education activities. In these processes, the university's internal organisation and various administrative processes in the affected faculties have been perceived as barriers to engaging in cross-faculty collaboration. As an example, collaboration on education activities requires specific agreements regarding the distribution of FTEs, and the faculties use different sets of rules to plan education activities. This is a challenge which has restrained the opportunities of the Department. The challenge is articulated in the general 2016 strategy for University of Copenhagen, which states that the university will:

> Promote collaboration on research, teaching and dissemination by removing internal barriers. Managers at all levels should promote collaboration and stick with the University's overall objectives. One way of doing this will be to continue to incorporate a budget model that is not perceived as an obstacle to collaboration.

Finally, the current shortage of physical space is seen as a barrier to growth.

The competitive situation in IT research and education

The Copenhagen metropolitan area and the rest of Denmark have several strong research communities, which are also engaged in attracting large and considerable research grants. This competitive situation is particular to information technology research and it is enhanced by the fact that information technology/computer science has no independent place in the Danish research grant system but is always in competition with the core areas of science, such as engineering and health sciences, which also cover other research areas than information technology.

However, this intense competition is not only a challenge. It may also be an opportunity if it leads to the successful establishment of partnerships with relevant research communities aiming to attract research grants together.

The education area faces similar fierce competition in attracting the most qualified students. The current high dropout rates from computer science programmes weaken the Department's position in the competition for the best qualified students.

Public visibility of the department

Being part of a large university, the Department as an independent entity has limited possibilities of achieving public visibility. This makes it difficult for the Department to participate in relevant political and scientific discussions – which would also require considerable coordination with the rest of the university.

IT RESEARCH IN THE COPENHAGEN METROPOLITAN AREA
The Copenhagen metropolitan area has research environments within the fields of information technology and computer science at the IT University of Copenhagen, the Technical University of Denmark, Roskilde University, Copenhagen Business School, and at a branch of Aalborg University in Copenhagen.
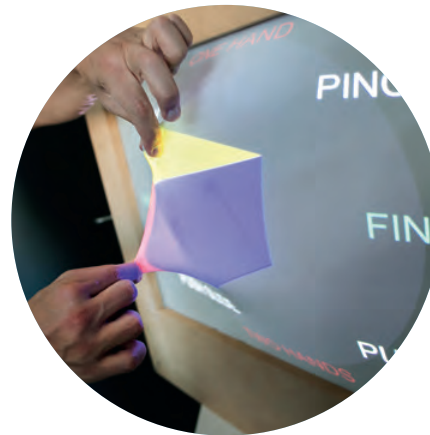
ORGANISATIONAL DEVELOPMENT

Sustainable and agile organisation

Information technology is a relatively young research field which is evolving rapidly – supported by research at universities and especially research and development in the European, US and Asian industries. This situation calls for the Department to be constantly adaptable and attentive to new trends and to be at the forefront when new research areas emerge. It requires highly qualified researchers and an underlying organisation that is able to support this process – and not least focus on maintaining a good working environment. Furthermore, the development requires that the programmes offered by the Department be continuously adapted to the development and that the Department is always able to offer up-to-date, high-level study programmes with an adequate number of professionally qualified teachers with excellent teaching skills.

During the past five years, the Department has undergone numerous organisational changes, such as the relocation of its section of Human-Centered Computing to new locations on the South Campus. During the same period, the Department established a highly qualified and sustainable administrative staff to support the Department's research and education activities. The staff also has special marketing and student recruitment responsibilities.

In 2013, the Department reorganised its administrative staff in order to achieve an even more sustainable organisation. A key element of the new administrative organisation was the establishment of a unit specialising in research management that will contribute to achieving the objectives set partly in the Department's research strategy and partly in the Department's strategy for business cooperation. This new organisation will be fully implemented during the period until 2017.
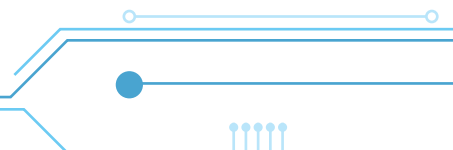
Strengthening the common identity along with involvement and participation

As the geographic separation continues to pose a challenge to the Department's management and employees, the Department will, during the period until 2017, endeavour towards the development of a stronger common identity and support activities to strengthen internal cooperation across professional and geographical barriers. Furthermore, the desired increase in the Department's activities requires that sufficient resources are available.

The Department sees freedom of research and involvement and participation of staff and students as fundamental values that the Department supports. In 2013, the Department established a Department Council in accordance with the University Act and the Statute for the University of Copenhagen. The faculty members elected to sit on the Department Council are all young researchers who can contribute with innovation and thus inspire non-traditional activities. In the coming strategy period, the Department Council will constitute a significant player in the implementation of the various strategy objectives.

Head of Department

Secretariat

CITI – Centre for IT Innovation

Organisation chart for the Department of Computer Science

APL: Section for algorithms and programming languages

IMAGE: Section for image processing and image analysis

HCC: Section for human-centered computing + CCC

Sections constituting the daily backbone of the Department

The Department has three sections, all of which have widespread autonomy and manage a part of the Department's funds in accordance with a set of common principles. This is seen as a key asset which the Department will maintain and possibly strengthen in the period until 2017, because the decentralised budgets contain important incentives to provide additional funds to the section and to subject new acquisitions and activities to an economic resource evaluation. The autonomous sections, however, also involve a risk that employees feel more rooted in the section than in the Department as a unifying organisation. The Department management therefore endeavours to create an equally strong sense of belonging to the Department as to the section, while sections also serve as a basis for individual academic staff research and education activities.

The Department will increase research collaboration across sections, e.g. by creating interdisciplinary laboratories within the Department. In the previous strategy period, the Department established laboratories as subsections, and these have been extremely beneficial for the internal cooperation.

As the Department's activities will increase towards 2017 in line with the overall general quantitative objectives, the existing sections are unlikely to be able to accommodate the increased activities. The Department therefore expects to have more than three sections in 2017. Such sections will have a number of associated laboratories, research centres and units with special responsibilities, including Centre for IT Innovation, Centre for Communication and Computing and possibly the proposed consulting services for data management, data modelling and simulation.

Study environments in old and new settings

The Department of Computer Science is known for its special study environment, which attracts many students and creates a sense of unity and a basis for academic collaboration and community among the students. The special study environment is rooted in the student facilities at Universitetsparken 1. The Department will – if the University of Copenhagen can no longer make these facilities available – endeavour to transplant this particular study environment so that it can take root in new locations.

PROGRAMMES THAT CREATE VALUE AND GENERATE GROWTH

The Department of Computer Science is continuously taking steps to develop its study programmes and to establish new programmes, including the development of new IT study programmes in partnership with other disciplines. The number of applications for the traditional computer science programme has also increased within the last five years while the number of applications for the cross-faculty IT programmes has increased significantly; especially the Communication and IT programme has seen a remarkable increase. The restructuring of the computer science Master's programme into a programme taught in English has also resulted in an increase in the number of foreign students, which accounted for half of the students on the programme in 2012.

THE CONFEDERATION OF DANISH INDUSTRY AND THE DANISH IT INDUSTRY ASSOCIATION WANT MORE CANDIDATES WITH IT SKILLS

The Confederation of Danish Industry, DI-ITEK, estimates that 1,000 additional people with a university degree will be needed until 2017.

Source: http://itek.di.dk/nyhederogpresse/nyheder/pages/stadigflerelaeserit.aspx

The Danish IT Industry Association finds it vital to Danish growth that growth industries, such as the IT industry, have access to candidates with the right skills. Both the number and quality of candidates are important to retain Danish jobs in a global market. In 2012, one in three IT businesses had vacant IT jobs. The Danish IT Industry Association wants
- incentives to be created for universities to offer more students a place in the IT area
- grants that follow the political ambition to increase the admission of students for the purpose of maintaining and increasing the quality of the study programmes.

Source: IT-Branchens politiske holdningskatalog 2012-2013 (The Danish IT Industry Association's catalogue of opinions 2012-2013)

The corporate sector and Danish society in general increasingly demand more highly skilled IT professionals. The Department will help meet the demand by aiming to increase the number of Bachelor's and Master's programme students.

Programme	Admission 2012	Expected number of Bachelor's and Master's programme students in 2013	Expected number of Bachelor's and Master's programme students in 2017
Computer Science – Bachelor	155	80	100
Computer Science – Master	88	60	90
Science and IT – Bachelor	28	10	40
IT and Health – Bachelor	45	10	40
IT and Health – Master	12	0	30
IT and Cognition – Master	18	10	30
Communication and IT – Bachelor	73	32	65
Communication and IT – Master	26	20 [2]	45
Total number	445	222	440

The Department of Computer Science wants to increase the overall education activities from 360 FTEs in 2013 to 500 FTEs in 2017. A major part of these activities are expected to be linked to cross-faculty IT programmes.

Focus on matching expectations
There is still room for improvement – especially when it comes to recruiting qualified students who have the required interest in the subject.

Matching expectations through increased awareness of the programmes
The efforts during the strategy period will focus on attracting students who have the right skills, interests and prior knowledge of the content of the programme and its potential. This will include initiatives to raise awareness of the content of the programmes in

upper secondary schools from where the students are recruited. This is particularly to prevent students from becoming surprised by the mathematical content of the courses, and this will eventually help reduce the dropout rate – and vice versa make it clear to students interested in mathematics that computer science could be an option for them. The Department will also endeavour to increase the admission to the interdisciplinary programmes.

Increased presence in upper secondary schools
The Department has launched a number of initiatives aimed at students and teachers in upper secondary schools, and this effort will be expanded significantly during the strategy period, e.g. through study projects. Furthermore, the Department will continue to contribute to the various recruitment activities launched and coordinated by SCIENCE, such as open house and student for a day events.

Clear and marketable study programmes
When recruiting students, it is important that the study programmes represent a number of clear career paths for the students. It is therefore essential that especially Master's programmes are profiled towards different possible career paths. As a result, the Master's programme in Computer Science and other IT study programmes need to have clear and marketable profiles that students – and employers in the corporate sector and public administration – can identify with. The Department will work to strengthen the profiling of the study programmes during the strategy period.

Bachelor's programme in Computer Science taught in English
As computer science is an international profession, it is important that students are trained as early as possible to have English as their working language. The Department will consider options and the pros and cons of offering the Bachelor's programme in Computer Science wholly or partly in English.

[2] The figure is an estimate for 2014 as the programme has not yet completed a Bachelor project course

Retaining students

There is still room for improvement when it comes to retaining the students admitted to the programmes. The Department has already launched various activities, such as employment of mentors and strengthening counselling initiatives in collaboration with University Education Services at SCIENCE.

Education form and content

Even though these activities have already had a beneficial effect, focus on retention is still needed. The Department will address the problem of retaining students from several angles and also review form and content of its educational programmes, e.g. by integrating theory and practice in the first year of the programme and through company visits. Initiatives focused on meeting the students' different academic qualifications especially in programming will also be part of the Department's considerations that may include differentiated education experiments. Finally, the Department will focus on strengthening research-based education as the primary element of all courses.

Development of improved teaching methods and ongoing quality assurance and strengthening of the teachers' teaching skills will also be found on the palette of initiatives that the Department will undertake.

Revising the Computer Science Bachelor's programme

The Department has carried out an analysis of Bachelor's programmes at other universities in Denmark and abroad, and has found inspiration for a new structure of the Bachelor's programme in Computer Science. Minor adjustments to the Bachelor's programme are already being implemented.

During the strategy period, the Department will analyse the need for a more comprehensive revision of the programmes and recommend revision of the programmes where necessary.

Economic resource assessment of the sustainability of courses

For the purpose of ensuring appropriate prioritisation of its resources, the Department will review the sustainability of the individual courses. The Department's expenditures for courses, etc. must be kept at an acceptable level and it should therefore be assessed whether courses with limited number of applicants should be restructured into seminar courses or cancelled entirely. If a highly specialised course is not sustainable, the Department will look into the possibility of offering the course in collaboration with other universities.

International exchange students

The international exchange students have increasingly applied for the IT study programmes to which the Department contributes. This particularly applies to the Computer Science Master's programme taught in English. However, the fact the Department can only accept a number of exchange students which correspond to the number of Danish students studying abroad is a major limitation. The Department will therefore make an effort to increase the number of students who avail themselves of the opportunity to study abroad.

New interdisciplinary courses, specialisations and programmes

Interdisciplinary study programmes

The Department already participates in several interdisciplinary programmes. Together with the Centre for IT Innovation, the Department will be ready to collaborate with other faculties on establishing other interdisciplinary IT study programmes.

IT courses and specialisations under existing programmes

As information technology plays a role in all disciplines, the Department will offer courses relevant to providers of other programmes at the University of Copenhagen. Development of various specialisations in IT in existing study programmes will also be included in the Department's considerations and dialogue with other departments.

Continuing education
Special programmes for IT professionals

A significant need exists for continuing education courses for IT professionals. Today, this need is mainly covered by private undertakings. The Department will engage in establishing appropriate programmes for IT professionals, e.g. in the form of courses offered within the framework of Open University. Offering a Master's programme in cooperation with other educational institutions will also be considered.

Special programmes for upper secondary school teachers

Training of upper secondary school teachers in IT will be an important new area of focus for the Department during the strategy period. Far from all upper secondary schools are able to offer an IT study programme, and this means that computer science as a subject is often "disregarded" by students in upper secondary schools. Continuing education courses for teachers in upper secondary schools will partly contribute to the raising of knowledge of Computer Science in upper secondary schools and partly contribute to strengthening the recruitment of students to Computer Science programmes and interdisciplinary IT study programmes.

THE NEW IT SUBJECT IN UPPER SECONDARY SCHOOL
Since 2011/2012, Danish upper secondary schools have, as an experiment, been able to offer a new subject, Information Technology. The objective is to create an up-to-date information technology course which provides students with relevant information technology skills, mainly developer skills and innovative skills – and which may inspire students to study the subject further. During the three-year experimental period, the subject is offered at the C and B levels as a specialised study and/or as an optional subject in upper secondary school.

(Source: The Ministry for Children and Education)

OUTSTANDING RESEARCH IS KEY

The Department's strategic objective is to conduct world-class theoretical and applied computer science research. Computer Science as a subject is about data and processes – or in plain language: information and computer software. Computer Science research is essentially interdisciplinary and consists of three overlapping areas:
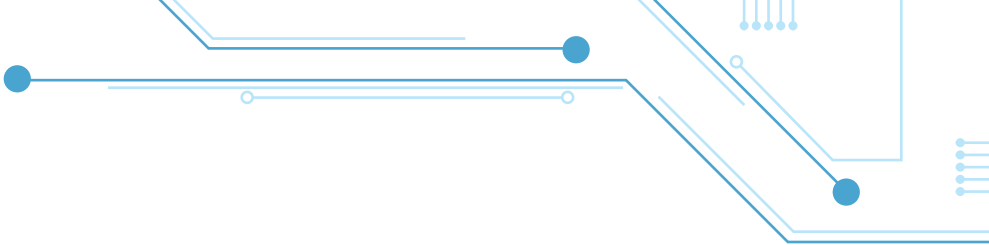
1. Properties of data and data processes (mathematics and science).
2. Software construction and design (engineering and science).
3. Human interaction with and use of computer systems (science).

The commitment of the Department to cross-faculty IT study programmes at the University of Copenhagen has called for significant academic breadth. With respect for the freedom of research, the Department will, during the strategy period, endeavour to focus its research in a few and clear areas of strength rooted in and across Department sections. This deliberate focus will help define and strengthen the Department's brand.

To achieve its overall quantitative objectives, growth in the research area will constitute a significant contribution. Therefore, the Department will work to ensure that the number of large-scale ongoing research projects increases from three projects in 2013 to six projects in 2017. Major research projects mean externally funded research projects where the Department's share is at least DKK 7 million, including overheads.

Clear incentives and objectives

In connection with its decentralised budgets, the Department has focused on incentives aimed at achieving increased funds for the sections in which quantitative objectives for research are a key parameter. During the strategy period, the Department will continue this strategy with increased focus on incentives to obtain external

funding and provide overall coordination and management of the effort. One option – beyond the annual appraisal interviews – is agreements with section heads on qualitative and quantitative objectives for the section's research activities and external funding. These agreements can be implemented in the sections by means of specific objectives for individual researchers, taking into account an individual's position and experience. The fulfilment of these objectives by the section and by the individual researchers will be evaluated annually in connection with appraisal interviews.

Focus on partnerships
During the strategy period, the Department will seek out and sign more agreements with industry partners and with partners in the rest of the university community and the public administration in order to implement joint research projects relevant to general society based on external funding.

Partnerships with the corporate sector and public authorities
The Department will continue to take steps to increase the number of applications with private companies and the Department will consider the possibility of concluding agreements with public authorities on the implementation of research projects or even of concluding agreements on public management support.

Partnerships with other researchers
The Department has already established some partnerships with other researchers at University of Copenhagen and at other Danish universities and universities abroad. The Department will supplement its existing partnerships with researchers at the University of Copenhagen and other universities, both informal partnerships for the purpose of increasing research activities and formal partnerships for joint research applications.

Optimising funding processes
Obtaining and handling external funding require a sustainable organisation that can assure the quality of the Department's applications and the proper management of the funds. The Department has already launched various initiatives aimed at optimising the application process and these activities will also constitute a major focus area for the Department during the strategy period.

Improving the quality of applications for external funding
The Department will take steps to improve the quality of the submitted applications. This includes both procedures for internal consultations and strengthening of administrative employees' skills, with respect to e.g. applications to foreign funding providers and especially applications for EU funds.

Strong administrative support
The Department already benefits from expertise available centrally at University of Copenhagen and at SCIENCE for quality assurance of applications for external funding. In 2013, the Department has also established a local research support unit, which will be further developed during the strategy period and evaluated annually.

Better conditions for young researchers
Employees are the main resource of the Department and young researchers constitute both an important resource and a root zone from which highly qualified and respected researchers emerge. It is therefore important that the Department offers good conditions for young researchers. Apart from good and healthy working conditions, this includes coordination and quality assurance of relevant and good research training offers for PhD students and professional guidance and support, e.g. through mentor schemes, and assistance in applying for external funding.

A key focus area is the conditions for young foreign researchers. The Department will provide assistance in the process of integration of academic and social environments, in administrative procedures and in the Danish society in general. The Department will support the activities aiming at developing a tenure-track scheme for highly qualified young researchers and contribute to the creation of relevant tenure positions at the Department. This will benefit both the Department's ability to attract qualified young researchers and the young researchers' motivation and security. Furthermore, the Department will make an effort to establish good and secure employment for post.docs.

STRENGTHENED EXTERNAL COLLABORATION

T he activities of the Department require ongoing collaboration with many other different players in private companies, in the public sector and in other research communities. This collaboration constitutes an important strength in relation to increasing the activities of the Department and in relation to delivering both research relevant to the society and in relation to delivering qualified graduates for the various employers of students from the Department.
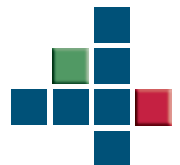
Interaction with industry

DIKU Business Club plays a central role in the collaboration with industry. In 2012, the Department appointed a Deputy Head of Department for Innovation and Business Collaboration, whose key task is to promote interaction with industry, in particular within the framework of DIKU Business Club. During the strategy period, the Department will increase these activities with a view to achieving more research partnerships with the corporate sector and with a view to concluding more agreements on business and innovation projects for the Department's students.

DIKU BUSINESS CLUB
DIKU Business Club serves as a framework for the collaboration between the corporate sector and the Department of Computer Science on innovation, growth and knowledge sharing. The Business Club has about 25 members and a group on LinkedIn with 200 members.

DIKU Business Club

Another means of increasing interaction with industry will be conclusion of partnerships with "Godkendte Teknologiske Serviceinstitutter" (Approved Technological Service Providers) on shared positions or industrial professors. Better branding of the Department will be an important catalyst in this process.

Interaction with the private sector, including increased awareness of the Department, is also a factor which will increase through the interaction with the industrial organisations, such as DI-ITEK, the Danish IT Industry Association, and networks, such as Infinit. It will also support participation in EU events and in national and international events where representatives from companies with an interest in Computer Science meet.

During the strategy period, the Department will also increase focus on supporting its own researchers and students who wish to establish private businesses.

Interaction with public authorities

The Department has already established some informal partnerships with public authorities, but the Department expects many additional opportunities for concluding partnership agreements. This could be in the form of student projects and research projects supporting large public IT projects or the development of IT standards. The Department will therefore take a much more proactive approach in relation to public authorities.

The department sees opportunities in supporting the public management sector and will carefully consider, and possibly pursue, formal agreements in this direction.

Interaction with other research communities

The Department already has a number of collaboration agreements with foreign universities on joint research projects and on exchange of students. During the strategy period, the Department will seek more opportunities for partnerships with foreign research communities which can place the Department in an improved position, e.g. when it comes to obtaining external grants from foreign funds or from the EU.

Collaboration agreements with other national or foreign research communities and the private sector will also be considered further.

INFRASTRUCTURE

During the strategy period, the Department will work towards increasing the standard of the infrastructure, comprising the physical environment of the Department and the IT infrastructure for the benefit of research in general at the University of Copenhagen.

Good working conditions and physical environment

The physical environment of the Department has varying standards, which means that working conditions vary in different premises accommodating the Department. Therefore, the Department will continuously take steps to improve the physical working conditions for all employees through targeted follow-up on workplace assessments.

During the strategy period, the Department will consider the pros and cons of relocating the entire Department to one single address or – at least to one campus.

As the physical environment sets certain limitations for the extent to which the Department can expand its activities, the Department will carefully consider both physical and other barriers prior to engaging in new activities.

Contribution to IT infrastructure at University of Copenhagen

Research in information technology requires a good and sustainable IT infrastructure. During the strategy period, the Department will therefore take steps to establish a new experimental computing infrastructure which can be used both by the researchers in the Department and by other research communities at the University of Copenhagen. Such infrastructure will supplement the existing national and international IT infrastructures, including commercial cloud providers. Finally, the establishment of a close partnership with ESS-DMSC will be included as part of the Department's activities during the strategy period.

The Department has submitted a proposal to the Faculty of Science for the establishment of a consultancy service covering data analysis, data modelling and scientific computing, which is proposed to be managed within the Department of Computer Science. If this proposal is accepted, the consultancy service will be established during the strategy period.

DIALOGUE AND COMMUNICATION

Since 2011, the Department of Computer Science sustains a Communication Committee, which is composed of representatives from sections, management, DIKU Business Club, the Education Committee, the Research Committee and a representative from SCIENCE Communication. The Communication Committee discusses key issues concerning the Department's external and internal communication and takes initiatives in key action areas, such as recruitment, research dissemination and campaigns.

Strengthening the Department's brand and profile

There is a recognised need to strengthen the branding of the Department. The Department of Computer Science, DIKU, is not an unknown brand in IT circles but the signals from these circles are different. In addition, a number of myths and theses about what stakeholders really know about the Department's research, education and business collaboration remain partly unconfirmed. With DIKU being a strong and well-known brand, the Department will be better able to attract the most qualified students to the study programmes to which the Department contributes.

During the strategy period, the Department will carry out a stakeholder analysis to gain more knowledge of its position in society in order to focus the communication and branding initiatives.

Strengthened communication and targeted marketing

The website diku.dk plays a key role in external communication supplemented by various other channels, such as the newsletter @diku, faculty newsletters, various social media, including the DIKU Facebook site and Twitter account, DIKU Business Club LinkedIn group, info screens on the two campuses and targeted media campaigns.

The Department will make a dedicated effort to communicate particularly value-adding elements to the general public, such as continuing education courses for IT professionals and teachers in upper secondary schools, business projects, stories about researchers and students and news about names and grants which can further strengthen the reputation and goodwill of the Department.

The Department will take initiatives to maintain and strengthen its strong international position, e.g. by developing research sites on the Department's English website and by increasing the number of international press releases and research stories. Together with SCIENCE, the Department will make a targeted effort to improve communication about the Master's programme taught in English with a view to attracting the best qualified foreign postgraduate students.

Integrating the gender perspective in all areas

The proportion of women in computer science programmes is 6-10%, fluctuating from year to year. This applies to Bachelor and Master levels and to scientific employees.

The Department will strive to brand computer science to women with a view to creating a more balanced study environment and to attracting competent female students.

Networking with upper secondary schools – particularly in relation to information technology as a subject

Computer Science is not a compulsory subject in Danish upper secondary schools, it will therefore take much effort to encourage students in upper secondary schools to choose a degree in a subject not as well known to them as the classical science subjects.

The Department will intensify the dialogue with upper secondary schools in Denmark to achieve improved insight into the needs of teachers who teach IT and to get closer to students who have the potential to study Computer Science or interdisciplinary IT programmes after graduating from upper secondary school.

Strengthening a digital literacy in society

Aquiring digital literacy early in school life is an important prerequisite for meeting society's demand for more IT specialists and the increasing demand for IT skills in other subjects at university level as well as in upper secondary schools. The Department wants to contribute to this important societal development. The Department wants to take part in the public debate about strengthening the digital culture in society – partly by offering competence development to primary, lower secondary and upper secondary school teachers and partly by networking with different influential bodies in society that can promote a digital culture.
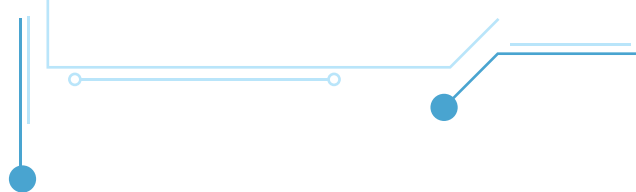
Since the appointment of the Deputy Head of Department for Innovation and Business Collaboration in 2012, the Department has focused on integrating the Department in relevant external networks and decision-making processes. This process will continue in the coming strategy period with a view to achieving influence on the development in the information society.

Celebrating our great students and graduates – and our excellent research

Internally, there is a need to proudly communicate the values which Department possesses – it may be research talents, good results, grants received or special achievements of students or groups of researchers. The Department has established a number of prizes to be awarded every year to employees who have made a special effort to communicate research results.

The Department will continue its efforts to strengthen internal communication and the good stories.
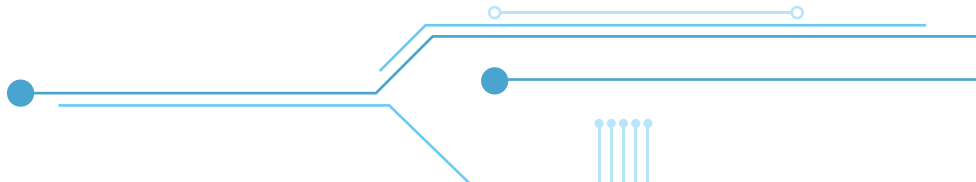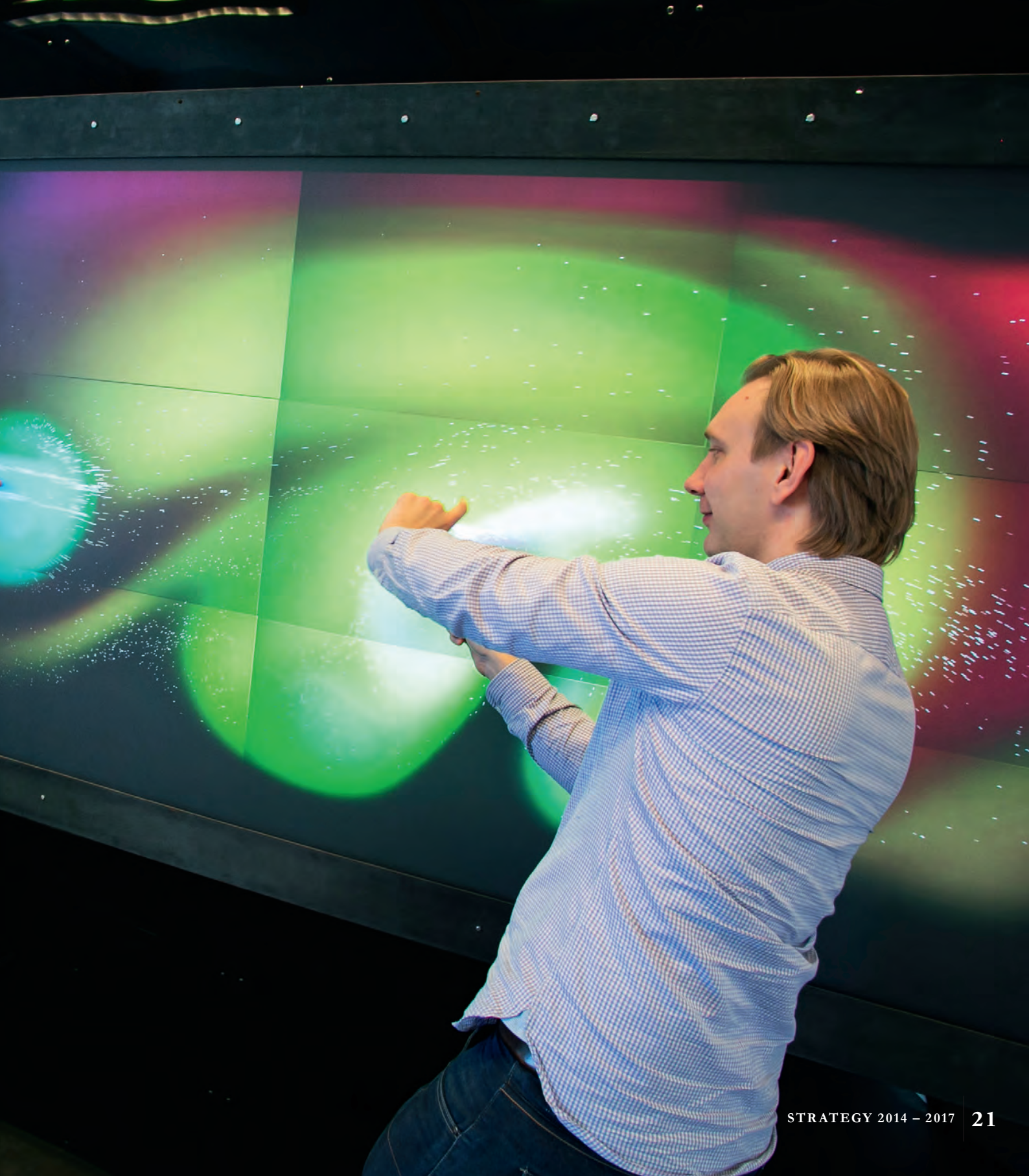
PROFESSIONAL PARTNERSHIPS WITH OTHER DEPARTMENTS AT UNIVERSITY OF COPENHAGEN

J ust like mathematics and statistics, computer science is an important component of various other subjects. The Department will take steps to seek collaboration opportunities with other disciplines, and the Department receives frequent requests from other departments at University of Copenhagen for professional partnerships.

CITI as catalyst for interdisciplinary research and education collaboration

CITI, Center for IT Innovation, has published a strategy for the period 2013-2015, stating that the center will promote continued growth in interdisciplinary IT study programmes and research at the University of Copenhagen in partnership with internal and external parties.

Partnerships with other departments at SCIENCE

The *science and IT* study programme is a good example of collaboration between the departments at SCIENCE. It is a study programme centered around mathematics and IT, but it also contains elements and profiles from other science programmes, such as physics, chemistry and geology. During the coming strategy period, the Department wants to contribute to attracting more students to this study programme while also maintaining the broad scientific profile.

In respect of research, the Department wants to continue and/or develop collaboration with other Departments at SCIENCE, such as with the Department of Mathematical Sciences on *operations research and machine learning,* with the Niels Bohr Institute on *computer systems, image analysis and computer simulation,* with the Department of Biology on *bioinformatics,* with the Department of Plant and Environmental Sciences on *image processing,* as well as with the Department of Science Education on *e-learning and computer-aided teaching.* The Department also wants to develop entirely new partnerships with other departments at SCIENCE.

Partnership with the Faculty of Humanities

The Department contributes to several interdisciplinary study programmes at the Faculty of Humanities. The key effort is in the Bachelor's and Master's programmes in *Communication and IT,* which the Department offers in collaboration with the Department of Media, Cognition and Communication. The study programmes combine computer science and media studies with competencies in design and innovation. During the strategy period, the Department wants to contribute to continued academic development of these programmes, particularly with a view to strengthening the computer science dimension in interaction with elements from media studies.

The Department also contributes to the Master's programme in *IT and Cognition,* a study programme taught in English which combines psychology, computer science and language technology. The programme is offered by the Centre for Language Technology. During the strategy period, the Department wants to contribute to assuring the quality of the study programme with respect to attracting the right students and ensuring efficient completion.

In 2011, the Department established the interdisciplinary *Centre for Communication and Computing* in partnership with the Department of Media, Cognition and Communication and the Centre for Language Technology. In 2013, the group of partners was expanded with the Royal School of Library and Information Science, which had merged with the University of Copenhagen. The objective of the centre is to strengthen interdisciplinary research in the interface between communication, language technology and IT to ensure that research conducted under the interdisciplinary study programmes is firmly rooted.

During the strategy period, the Department will endeavour to strengthen and further develop the centre. Particular focus will be on strengthening activities in the fields of *information retrieval, big data, user experience and computer-supported co-operative work.* In this connection, the Department will look into the opportunities of establishing shared positions in collaboration with other partners in the centre.

Partnership with the Faculty of Health and Medical sciences

In partnership with the Faculty of Health and Medical Sciences and the Technical University of Denmark, the Department is involved in the Bachelor's and Master's programmes in *IT and Health.* The study programmes combine computer science, engineering and health science for the purpose of providing students with the competencies to understand the needs of patients and treatment providers and the demands for new technology. During the strategy period, the Department will contribute to the continued academic development of the study programmes.

The Department has research collaboration – formal and informal – with departments and centres at the Faculty of Health and Medical Sciences and hospitals in the region, and during the strategy period, the Department wants to expand this collaboration. Among the current collaboration partners are the Department of Public Health, Capital Region of Denmark, Rigshospitalet (Copenhagen University Hospital) and Gentofte Hospital, which all participate in externally funded research projects with the Department.

Furthermore, the Department has informal collaboration with the Department of Neuroscience and Pharmacology. The Department also collaborates closely with the PET Centre at Rigshospitalet.

During the strategy period, the Department will make efforts to *maintain* and *expand* collaboration with the Faculty of Health and Medical Sciences in connection with activities with regions and other public authorities and in connection with developing health technology in collaboration with private companies.