

**Reykjavik University**

**Department of Computer Science**

**Formative Research Evaluation – November 2022**

## **Panel Report**

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## **Preliminary remarks**

This report summarizes the findings of the evaluation panel who were convened to undertake the first formative research evaluation of the Department of Computer at Reykjavik University. The panel consisted of Professor Geraldine Fitzpatrick (TU Wien), Prof Kim Larsen (University of Aalborg), and Professor Michael Wooldridge (University of Oxford).

The panel was presented with a self-evaluation report covering the period 2019-2022. The report was delivered well in advance of the site visit, which took place over 22-23 November, 2022. During the visit the panel met with senior management both at the university and department level, representatives of each of the Department's three research centers, junior faculty, postdocs, and PhD students. The panel had ample opportunity to discuss both specific research directions and activities, as well as the research environment, management and culture of the department and centers.

Overall we were pleased and impressed to find that a department which is very young in international terms has succeeded in establishing itself as an internationally competitive hub for Computer Science research. This is a noteworthy achievement by any measure, but is particularly impressive when considering the highly competitive culture of international computer science research, where world-class researchers are very highly-sought after and are able to demand highly lucrative packages.

In the report that follows, our findings are structured into four sections. First we present our findings related to the department in general; then we discuss each research center; and finally, we present our findings based on discussions with faculty, postdocs, and PhD students. In each section, we first present the key strengths as we perceive them, then the challenges faced, and finally our recommendations.

We emphasize that the observations which follow should be understood in the overarching context that we believe the department is in good shape overall, and on a good trajectory.

## **The Department**

### ***Strengths***

We repeatedly heard that the department is a highly collegial environment, and has largely avoided the curse of factionalism that taints so many university departments.

The department clearly benefits from energetic leadership with an ambitious agenda for development, and a good awareness of the standards that prevail at research-led international universities.

We were impressed by the international links that the department has been able to establish, with many visitors who clearly contribute to the research culture of the department at all levels. We saw evidence that directly experiencing this culture has been instrumental in a number of hires and in attracting PhD students.

The self-evaluation report we were provided with gave a number of key performance indicators, such as volume of publications in internationally competitive journal and conference venues, research awards such as best-paper prizes, and the acquisition of research funding. We were pleased to note that, modulo some expected minor year-on-year variations, all of these measures seem to be on a positive upward trajectory.

We noted that much of the Department's research portfolio is strongly interdisciplinary, and addresses key societal challenges with demonstrable national impact.

We would single out the major new EU Sleep project as a wonderful achievement - we understand this is by some distance the largest grant secured by the Department, and is by any measure a very substantial research grant.

Finally, we noted that the Department does well in terms of diversity at faculty level, with an increased number of female staff. Other aspects of diversity are less clear, though this perhaps represents Iceland's racial demographic.

### ***Challenges***

In our discussions with several research centers, we noted some tension between the overall goal of autonomy and academic freedom for individual researchers, and the potential of increasing research impact and funding through collaboration. Developing a coherent research strategy and clearly setting expectations for faculty will help to address this issue.

The Department seems to be undergoing a transition from a small group, where management and processes can be relatively informal, to a larger one, where more formal structures are necessary. Most likely for this reason, in our discussions we heard several times about lack of transparency of decision making at department level. Issues raised included funding distribution to centers, teaching allocation, and counting and equity of teaching load. One key aspect of this seems to be the role of the Senate (e.g.,

with respect to promotion): this seemed obscure to several faculty. Greater clarity around this issue would be desirable.

We understand the university has a “two languages” policy, in which both Icelandic and English have equal status. However, we heard several times that the policy is not always adhered to, and some staff felt disadvantaged by this as a result.

Several of the research centers seemed to us to be collections of singleton researchers with little to say to each other. As a result, some research centers lacked coherence in their research topics. It might be desirable to think about potential academic appointments that bridge different areas, to provide greater coherence in research.

While, as we noted above, the department has done a wonderful job in establishing itself on the international scene, more could be done to raise the profile of the Department and Reykjavik University internationally. The out-of-date websites of some of the centers could also be improved to showcase the work of the department.

Finally, two minor points: First, more could be done to retain a higher proportion of BSc students for the Masters program; and second, more could be done to provide support for research grant proposal writing, for example around issues such as budgeting.

### ***Recommendations***

First, we urge all research centers to develop and clearly articulate their research direction and vision. In all our meetings we started by asking what the big challenges were that the group worked on – none of the centers gave a crisp answer. While it is clear that individuals within the centers are doing good work, it was disappointing not to hear of any clear research agenda.

More could usefully be done to increase collaboration within research centers, across centers, and with other departments of the university. The panel suggests that a competitive pool of seed money might be set aside to support interdisciplinary collaborative projects.

The EU offers large grants, which are clearly within the reach of many members of the department. We urge the department to be much more ambitious about applying for EU research funding. Apart from anything else, we believe an Icelandic partner in EU projects will be extremely attractive. This also brings implications of needing good research office support for the application and administration of such grants.

With respect to the issue of transparency, more explicit criteria should be provided for key departmental decisions (funding, appointment, promotions, and so on). It needs to be clear which individuals and/or committees are responsible for which decisions, and the criteria upon which these decisions are made. About promotions specifically, while some people expressed appreciation for the lack of prescriptiveness of criteria, more clarity could be provided about what they needed to provide to evidence performance against the criteria.

There is scope to further develop international networks, which are essential for recruitment of faculty, postdocs, and PhD students. Networks might arise through one-to-one research collaborations, international collaborative projects, taking more advantage of programs like Erasmus and internships, and so on.

There is scope for several members of the department to receive ACM Awards (e.g., ACM fellow or ACM distinguished member) as well as other international awards. We urge the department to be proactive in nominating individuals for such awards. This will also go towards increased visibility of the department.

We urge that early consideration is given to succession planning for senior roles – in particular for the Head of Department. Given the growth mentioned above, it may also be timely to consider bringing more people into the leadership team with specific areas of responsibility, to relieve the pressure on the Head of Department and free them up to do more strategic development.

While the increase in the number of women in the department at almost all levels is impressive, this seems to have been largely due to individual/grass-roots contacts. It could be timely now to consider how to bring in more women and diverse others into the Department with more strategic targeted initiatives.

Finally, some minor observations:

- There is scope to make more use of postdocs and PhD students in the support of teaching. This would give them more experience and would also help in managing faculty teaching loads.
- The descriptions of research centers in the self-evaluation document varied considerably in terms of length, detail, and organization. Please use a joint template for description of centers in future research evaluation.
- The department should provide support for centers in order to maintain and update their web-sites (bi-lingual).

## **CADIA**

### ***Strengths***

We were particularly impressed within the center with work on virtual reality/virtual agents and the work on language technologies. The work on language technologies has an opportunity with the Icelandic language to work on machine learning/NLP with small data sets – this is a very large problem at present.

There is clear evidence within this center of strong local impact, including two start-ups. More generally, much of the work of the center is application driven, with substantial opportunity for impact.

The center has a good historical record of EU funding.

### ***Challenges***

The center vocalized considerable concern over space for research, and more open access to lab-facilities for Bachelor students. Indeed, discussions about space took up a considerable proportion of our allotted time for discussing research.

Some faculty members also voiced frustration around what they perceive to be a lack of transparency in the way the university allocates research funds to individuals and centers.

It was evident that, as with some other areas in the Department, there is a lack of critical mass and synergy in terms of research areas.

The involvement of faculty in the new AI-focused masters programs require substantial resources from members of the center.

Finally, faculty perceive a lack of capacity for supervision of students (at all levels) they attract.

### ***Recommendations***

The Department should urgently meet with the center to review and resolve issues surrounding buildings and space allocation.

We recommend that the center pursues the opportunity to research ML/NLP with small data sets around Icelandic language technologies, and also look for ways to generalize from this base.

Given the historical success with funding, we believe there are opportunities here to attract further EU funding - particularly given the wealth of funding available in AI and ML at present. Areas such as virtual agents and virtual reality (the “metaverse”) could not be better positioned for funding.

Both the center and the Department need to be more realistic and strategic in balancing efforts in teaching (supervision), research, and collaborative applied projects. AI is an extremely attractive area for students at the moment, who naturally gravitate towards it. While this is natural, it can create issues for faculty in areas of high interest, who perceive that they are being asked to take on an unfair load.

## **CRESS**

### ***Strengths***

The center has a strong applied nature to their research and impact.

As stated above, the panel is particularly impressed with the new SLEEP EU project not just for the size of the grant but the cross disciplinary team brought together with CS people to address the complex challenges around sleep apnea. This has potential for huge societal impact at an international level.

While each person in the group works on different topics, there is none the less a strong sense of concerted effort in building a collaborative supportive research environment together (e.g., through retreats, reading groups, seminar series etc).

There was also good evidence of emergent collaborations on research through opportunistic and grassroots initiatives, with some tangible outputs such as grant proposals, papers.

Members of the center have also been active in hosting academic conferences in Reykjavik. This is useful for visibility and profile building, albeit at a cost of time and effort.

Many people in the group have strong links with local industry, particularly the software industry, both in outreach and connecting industry to students.

The center has been particularly successful in attracting many women at all levels.

### ***Challenges***

The center has quite a few relatively junior and/or new faculty and is at an interesting inflection point in its growth and in defining a shared identity.

As self-identified, there is a lack of a shared vision that adequately reflects the current members of the center including the PhD students.

Teaching load at the undergraduate level involving very large class sizes is putting a burden on many of the faculty. The members of the center also do not seem to be involved in giving Master courses which limits their access to Masters students.

There was an expressed need for more administrative support for grant applications.

### ***Recommendations***

We understand CRESS has a strategic away-day plan (retreat) Nov 22. We strongly support the plan to use this opportunity to revise a shared vision and encourage them to formulate a strong, coherent and ambitious research statement and plan.

The panel also thought that the potential focus on ‘the quality factors for software’ seems to be a promising direction for identifying what the people in the centre all share in common as a theme, and their different ways (e.g., topics, methods, etc) of exploring quality can be framed as a strength of the diversity of the topics the team addresses. Another potential direction, to mitigate research silos, is to explore the interdependencies between the different quality factors or similar.

The center could consider what more they could do, within resource constraints, to exploit their relevance to companies and industry. This could help with both attracting more Masters students and even potentially as a source of income, e.g. offer in-house training, life-long educational activities, professional certificates etc, some of which is already being done.

We strongly encourage the members to aspire to top-tier publication outlets for their work. Given the challenges some members stated re getting into the top conferences in their area, journals may be particularly promising here, with their possibility of multiple revision cycles.

To enhance visibility and international networks, members could also be encouraged to respond to relevant Open Calls that many ACM SIGs at least are currently doing (again modulo time and resources and personal career trajectory).

Many of the recommendations above have significant time and effort implications for people who are already feeling very stretched. We encourage the center to list and prioritize options that will have the most impact and be more feasible given constraints.

## **ICE-TCS**

### ***Strengths***

We were truly impressed by ICE-TCS that in a short span of time (inaugurated in 2005) has established itself as a world-class center within Theoretical Computer Science (TCS). In particular, we find that the center has been extremely successful combining Track A and Track B of TCS with notable research contributions within and recognitions from the sub-fields of Concurrency Theory, Logic, Programming Languages, Combinatorics and Algorithms.

The publication venues of the center include flagship outlets such as POPL, LICS and STOC and has received best paper awards (and nominations) at leading conferences. The center has an impressive visitor programme counting numerous leading researchers within the field of TCS.

The high standing of the center in the field of TCS is also clearly witnessed by the success in bringing leading conferences and workshops (ICALP, LICS, NWPT, Logic Colloquium, PODC). We believe that the visiting programme and the hosting of scientific events has been key to the high international visibility of the ICE-TCS.

The center has been very successful in acquiring national grants as well as grants from the university.

### ***Challenges***

From the discussion with the center the panel is of the understanding that it is not possible for the center to grow in capacity at present. We find that this will seriously limit the full exploitation of the high research potential of the center.

### ***Recommendations***

The panel encourages the center to keep up their excellent work. Maintaining the high international standing of ICE-TCS for a next period will be a major achievement in itself.

As for the other research centers we would highly encourage that the center formulate and articulate a clear coherent and joint research vision.

The panel strongly urges that senior staff in particular consider applying for ERC grants.

## **Junior Faculty, Postdocs, and PhD Students**

### ***Strengths***

The PhD students seem very organized and extremely involved in building and contributing to the research environment. The panel found a true feeling of ownership to the development of the department.

Several members of the junior faculty are successful in promotion, and contribute to the increased diversity in the department by serving as role models.

The two postdocs interviewed were enthusiastic about their work and the culture of the department.

### ***Challenges and Recommendations***

For all the three groups the role of the Senate is a bit obscure. The panel recommends that this is made clear and communicated in particular when it comes to the Senate's role with respect to promotion.

Some junior faculty were concerned about the transparency and fairness with respect to teaching allocation. In particular it was felt that junior faculty have difficulty in being assigned teaching tasks related to MSc students.

Junior staff expressed concern that the criteria for promotion are vague. The panel recommends that concrete examples of requirements needed for promotion be systematically collected and communicated.

The panel heard from several members of the three groups that the officially stated policy of equal support for English and Iceland is not always adhered to. We recommend that measures are taken to fully implement the two-language policy in practice. Similarly the PhD students expressed a deep desire to be offered Icelandic language lessons.

Finally, the postdocs felt a bit scientifically isolated. Moreover they did not seem to have a physical yearly status meeting. The panel understands that some degree of "scientific isolation" will result from the small number of researchers in the individual areas. The panel recommends that the department aims at creating a community among postdocs through joint social activities possible with the PhD students. Also – as was appreciated by the postdocs – it is vital for the university to maintain their strong network of international collaborators, which serves as the scientific peers of the postdocs.