An Equal Opportunity Concept for the Coordinated Research Effort AESC

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ABSTRACT

Even after years of systematic support to achieve equal opportunity of women, the number of women in informatics education and research in Germany is still too low. In this paper, we describe the equal opportunity concept that we developed for a coordinated research effort proposal. We first explore and describe the situation of women in computing at Karlsruhe Institute of Technology (KIT), which hosts AESC, before deriving concrete aims and measures we propose for AESC. With this short paper, we aim to share our equal opportunity concept so that it may be enhanced and extended by other coordinated research efforts and other institutions.

CCS CONCEPTS

• Social and professional topics → Computing education; Funding;

KEYWORDS

Gender diversity, Women in Computing

ACM Reference Format:

1 INTRODUCTION

Even after years of systematic support to achieve equal opportunity of women, the number of women in informatics education and research in Germany is still too low.

Thus, efforts have been and are made at all level of public funding to increase the proportion of women in informatics. A potential positive effect of the efforts is that the number of female professors in informatics in Germany has risen from about 5% in 2003 to 10% in 2013 [2].

2 PRESENT SITUATION

Our proposed excellence cluster AESC is interdisciplinary, but has a strong focus on computer science: About two thirds of the principal investigators (PIs) are computer scientists and the majority of the researchers working for non-computer-science PIs will also be computer scientists. Thus, when discussing equal opportunity statistics, we focus on the situation in the field of informatics. We expect that our conclusions and measures will also work for other AESC disciplines (such as engineering and physics) because these disciplines have similar demographics.

Table 1 shows that the proportion of women in informatics at KIT ranges from around 14% at the bachelor level to 12% at the professorial level (see Table 1). This is clearly too low, both from the point of view of gender equality as well as for attracting talented female researchers. On the positive side, the proportion of women remains almost constant over all career levels.

We conclude that the major problem is that too few women decide to study informatics after high school1. Thus, our main aim as a society has to be to encourage more women to study informatics in the first place.

In addition to that, it makes sense compensate for the loss of talented women during all career levels. Assuming that those women who have a particular talent for informatics choose to study informatics, one would even expect a higher proportion of women at later career stages. However, the proportion remains constant. Thus, there may still be hurdles for women even after deciding to study informatics. Thus, our second aim is to support women in informatics at all career levels.

3 CONTEXT AT KIT

At KIT, the aims for diversity and gender mainstreaming are an integral part of the mission statement KIT 2025. Defined strategic

In this paper, we describe the equal opportunity concept that we developed for the proposal “Algorithm Engineering for the Scalability Challenge” (AESC) within the so-called Excellence Strategy of the German Research Foundation (DFG)2. We first explore and describe the situation of women in computing at Karlsruhe Institute of Technology (KIT), which hosts AESC, before deriving concrete aims and measures we propose for AESC.

With this short paper, we aim to share our equal opportunity concept so that it may be enhanced and extended by other coordinated research efforts and other institutions.

1 The numbers have to be treated with caution because non-tenured assistant professorships were newly introduced only in 2002.

2 http://www.dfg.de/en/research_funding/programmes/excellence_strategy

3 Including graduates of the expired Diploma program.

4 Note that in Germany, the proportion of female high school graduates is about 50%.
targets are to increase the proportion of women at all qualification levels by creating a supportive research environment and working culture for both sexes. To achieve these targets, all faculties and service units are responsible for diversity and gender mainstreaming at all levels. When describing AESC measures in the following sections, we will also mention the related KIT-wide measures that AESC will build upon and extend. To measure achievements, a commission of the senate on “Equal opportunity and diversity” and a team for diversity management within the Human Resources Development Department monitor and evaluate all KIT-wide measures. Furthermore, all measures serving the reconciliation of work and family are monitored and advanced by the audit family-compatible university.

4 AIMS AND MEASURES FOR EQUAL OPPORTUNITY IN AESC

As mentioned above, our aims are to encourage more women to study informatics and to support women who study informatics and do research in informatics topics.

To formulate a measurable goal, we in particular aim to increase the proportion of women at all career levels starting from doctoral researchers to about 20 %, which corresponds to a relative increase of 50 %. This exceeds the gender equality targets set by KIT. To monitor the progress toward this goal, we will measure the proportion of women directly funded by AESC.

To achieve the defined goals, we structured the AESC gender equality concept into three components: recruitment (Section 5), career support (Section 6), and family support (Section 7). Additionally, we derived structural measures within AESC to monitor and continuously improve our measures (Section 8).

5 RECRUITMENT

Recruitment of female candidates at all levels will be the first and foremost measure since it bears a direct effect. This does not only mean the already practiced rule to prefer female candidates when several equally qualified candidates are available. Rather, we actively seek out and invite excellent candidates from outside KIT and particularly from outside Germany (where the proportion of women in technical subjects is often higher). Note that this activates the main research funding for promoting gender equality and particularly from outside Germany (where the proportion of women in technical subjects is often higher). Note that this activates the main research funding for promoting gender equality and thus goes far beyond the special funding for equal opportunity measures.

We will take explicit care that all selection activities respect gender considerations and other diversity aims. This is a task for all PIs. To successfully attract leading female as well as international researchers, recruitment processes will be supported by the KIT Dual Career Service. If the outcome of recruitment falls short of our expectations (i.e., less than 20 % women are recruited), then additional measures will be devised. For example, the diversity commissioner may follow recruitment processes more closely and provide advice for research groups with a low percentage of females.

5.1 Professorial level

With five female AESC PIs (20 %), we have achieved our goal at the PI level. We will ensure that at least one, but preferably two or more, of the new group leaders are female. For recruitment at all levels, but particularly for professors, every PI and advisory board member shall name qualified women, whom we will actively contact and ask to apply. The diversity commissioner, in close cooperation with the equal opportunity commissioner responsible for the department, will ensure that at least one professorial member of each AESC-related appointment committee actively takes diversity aspects into account.

5.2 Postdoctoral and doctoral level

To increase the proportion of women at the postdoctoral and doctoral level, the internship and aspirant grants we offer for international candidates will give preference to hiring females. In addition, there will be two AESC position for excellent female postdoctoral researchers.

Furthermore, we will encourage more female students to pursue a PhD and a subsequent academic career with a set of measures directed at them. First, the funding allowing students to present their results at scientific conferences will be preferentially given to female students. Additionally, we provide funding to allow excellent female students without a paper to attend conferences or summer schools. Second, AESC will organize an annual “become a researcher” day for female students only with talks and workshops on AESC topics as well as information about obtaining a PhD. As a part of this day, established female AESC researchers will talk about their research and their career choices and thus serve as role models. Third, AESC will organize a scientific colloquium with female speakers only and with the opportunity for less formal “fire-side chats” with the speakers for both female and male students at all levels. We have positive experience with similar measures from DFG Research Unit (Forschergruppe) 2083 and Research Training Group 2153.

### Table 1: Proportion of women at KIT’s informatics department.

<table>
<thead>
<tr>
<th>Career level</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted to BSc program</td>
<td>65</td>
<td>12 %</td>
<td>59</td>
<td>11 %</td>
</tr>
<tr>
<td>Students in BSc program</td>
<td>160</td>
<td>10 %</td>
<td>173</td>
<td>11 %</td>
</tr>
<tr>
<td>Students in MSc program</td>
<td>51</td>
<td>12 %</td>
<td>66</td>
<td>12 %</td>
</tr>
<tr>
<td>Master graduates</td>
<td>16</td>
<td>9 %</td>
<td>21</td>
<td>12 %</td>
</tr>
<tr>
<td>PhD graduates</td>
<td>7</td>
<td>11 %</td>
<td>8</td>
<td>13 %</td>
</tr>
<tr>
<td>Professors</td>
<td>4</td>
<td>11 %</td>
<td>4</td>
<td>11 %</td>
</tr>
</tbody>
</table>
5.3 Student level

Arguably, attracting more women to study technical subjects and computer science in particular is the most important measure for increasing the proportion of women since the small number of female students is the main limiting factor for all subsequent career levels. Female role models and practical experience during education are the two most important factors to sustain girls’ interest in science, technology, engineering, and math subjects (STEM) according to a recent study [3]. Additionally, their interest starts at the age of 11, but already declines at the age of 15.

The department of informatics at KIT already offers practical experience to pupils in form of a "science camp informatics" for girls aged 14–16, of internships for female and male pupils in the context of mandatory internship weeks at high schools (BOGY, ages 15–17), and of workshops for the national "Girls' Day" (ages 10–19). AESC will augment and support these offerings, particularly for younger pupils, with additional staff and content. Furthermore, we will organize an additional summer camp targeted at younger girls aged 11 to 15. This strategy will also be supported by our measures for public engagement and will leverage the high visibility of a cluster of excellence. Within these offerings, we will aim for multiple presentations by female PIs and researchers as role models. In order to procure the considerable amount of time that has to be dedicated to these events, we establish two complementary measures. On the one hand, every researcher who receives funding from AESC is responsible for at least once helping to support such an event. On the other hand, the amount of time spent is considered in our scheme for allocation of funds, where a share of research money are allocated based on equal opportunity and public engagement activities. Finally, AESC public engagement activities will be conducted in social media, e.g., with online games and videos, to inspire pupils, particularly young girls, with our topics.

6 Career Support

Career support is the second component of our equal opportunities concept, augmenting existing general measures for all early career researchers. The cluster will offer a tailored mentoring and coaching program. This includes one-on-one mentoring by a professorial mentor, thematic workshops (e.g., on career planning) and collegial coaching sessions for exchange and mutual learning. Also the "fire-side chats" mentioned under recruiting seem useful as an instrument for mentoring in a more informal atmosphere where, for example, female role models can share their experiences. Offerings that are also available for male researchers include consulting for family-related leaves.

In addition to the measures described here, there is considerable support from the KIT Human Resources Development Department for these activities.

7 Family Support

Family support and child care for parents within the cluster form the third pillar of our concept, which will also provide further incentives in recruitment, especially for female candidates.

KIT has four child-care facilities offering a total of 205 full-time and part-time child-care places, to which the cluster will provide preferred access. Additionally, KIT offers a vacation program of child-care during school vacation. Furthermore, KIT offers support for exceptional situations in its FlexiKids program. If the usual child-care provider fails due to illness or other causes, children can be cared for in one of KIT’s child-care facilities on short notice. Additionally, KIT maintains a network of independent day-care professionals who can provide care for children between 0 and 12 on short notice ("FlexiKids TagesMutter"). This support includes care for children in the evenings, weekends and overnight, as well as care for sick children. Additionally, we will organize child care for all AESC-related events for both KIT staff as well as external guests.

To the extent legally possible, AESC will provide extra funding for members to take children when going abroad to gather further international experience (such as for doctoral researchers when staying at international research organizations).

KIT already offers flexible working time models and home office options can be accommodated with funding through the cluster. We will equip a conference room with teleconferencing hardware, which will allow researchers to virtually attend AESC meetings from home. Additionally, we will fund digital workplaces for researchers that regularly work from home due to child care or due to caring for other family members.

To encourage researchers to take family-related leaves, we will fund parallel employment of a temporary replacement even before the family-related leave and we will partially fund contract extensions for researchers after such a leave.

The available family-support measures, which are offered for both women and men, will be made transparent in a positive list of supportable measures.

8 Supporting Structural Measures

To monitor and continuously improve our measures, one member of the executive board is elected by the steering committee as the diversity commissioner. The diversity commissioner will supervise and coordinate the measures described in the following and suggest additional measures if the outcome falls short of our expectations. Furthermore, the diversity commissioner will be supported by the management office. We expect that it will dedicate about four person months per year to equal opportunity issues. Furthermore, we will continuously reflect on our own behavior and attitudes and explore creative ways to promote gender equality and diversity in general. This shall enable us to identify barriers that potentially impede women, such as unconscious bias [1] or ways of male-dominated environments [4]. To anchor this aim in AESC, we will have invited plenary talks on gender awareness in the all-hands-meetings paired with a moderated process to generate ideas over the course of the meeting.

9 Discussion and Conclusion

With the presented measures in the three components "recruitment", "career", and "family", we are confident that we can improve opportunities for women in informatics at KIT. However, obviously, a coordinated research effort at one university has a limited influence on the opportunities for women nation- and even world-wide. Still, we think that our measures are of interest for a wider audience because of two reasons
• Sharing, discussing, and advancing equal opportunity concepts in the research community can help to improve support of equal opportunity. For this to be effective, both new concepts but also monitored results need to be shared.

• With our measures for recruitment at the student level (Section 5.3), we aim to not only reach prospective students in the region of KIT, but will reach out to girls and women all over German-speaking Europe.

Even though the number of women in informatics education and research in Germany is still too low after years of systematic support to achieve equal opportunity, we have seen improvements, which may be partially due to efforts at the level of public funding. We are confident that we can do our part to improve the share of women in informatics. We hope that our equal opportunity concept presented in this paper can inspire other researchers to devise measures how to support women in computing education and research.

REFERENCES


