

Title

Hack4Her: Hackathon for Female Students in the Netherlands



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The submission is on behalf of the Computer Science department at the Vrije Universiteit Amsterdam (VUA), where Katja Tuma is the budget holder for organising the event in collaboration with student volunteers.

Abstract

Hack4Her is the **only female-focused** student hackathon in the Netherlands in the past 5 years. Hack4Her aims to (i) **retain** female students in Computer Science careers, (ii) provide a **safe space** for women to showcase their technical problem-solving skills, (iii) give **recognition** in the form of prizes.

Hack4Her is a community building event bringing students together early on in their careers. Three challenges are developed each year, e.g., discrimination on Twitter, healthcare access problem, protecting women in cyberspace.

Since 2022, Hack4Her has involved 62 female students. Thanks to overwhelmingly positive feedback, Hack4Her is now an annual event.



Figure 1 **(NOT for public distribution!)**: Intense hacking in action

Description of the initiative

Too many **female students drop out of computer science** disciplines early-on which has a propagating negative effect on the proportion of women in academic positions and modern paths to wealth such pursuing high-tech careers in computer science (which started with a poor ratio [1] and had not improved [2] - see Dutch technical universities in [3]). The **lack of women academics** creates a **negative feedback loop** as it has been empirically shown that role models can push more women into the discipline [4-6].

The root of this problem lies with parenting, education system, teachers and peers which might contribute to **gender stereotyped beliefs** about high-tech professions [7] thus hampering girls' and women's later decisions about pursuing (and remaining) in high-tech careers. A mentality shift is a challenging long-term societal goal, requiring structural investments and policies, but certainly worth investing in.

Höhne and Zander [8] found empirical evidence of female students experiencing **greater uncertainty about their belonging** within the domain of computer science than male students. In addition, Höhne and Zander [8] found that **belonging uncertainty significantly predicted students' dropout** intentions above and beyond the pertinent predictors academic self-efficacy, expectancy of success, perceived future utility value of the subject, and previous academic performance. Therefore, short-term **goals with immediate actions** to improve this situation should urgently be taken by educational institutions (such as Universities) where a systematic gender gap exists.

At the Vrije Universiteit Amsterdam, we have heard from our own female students about symptoms of “not belonging”, such as stories about the uncomfortable stereotypes that are imposed in some student circles (“it’s better she writes the report, and he does the coding” and similar). This has motivated us to work together with the Student Diversity Committee and a group of student volunteers and organise a women-only student hackathon with the aim to **valorize and retain the female students** that are already studying at our University.

Research shows that activities such as STEM-based social groups, cliques, extramural clubs, or graduate programs foster a sense of belonging [9]. **Hackathon** is an event where people engage in rapid and collaborative engineering over a relatively short period of time such as 24 or 48 hours and is a great example of such an activity with **strong community building effects**. Since female participation in mainstream hackathons is poor (11%-28% reported in [10]) we organised a female-focused hackathon, following practices outlined by Kos [10].

To be more inclusive, we **do not mandate** the teams to deliver source code as a final product. In addition, the Student Diversity Committee has developed a **code of conduct** for the event that is presented on the first day which is important to **ensure social safety** and respect for **intellectual property**. We also do not collect any final deliverables and the judges assess the teams based on their presentation. Finally, we foster **different ways participants can engage** with the event other than just a competition (such as workshops and lectures) and allow people to leave earlier if desired.

Hack4Her is a 3-day event and roughly follows the structure shown in Table 1. It is important to allow some space for social activities (especially on the first day) in order to facilitate (e.g., with speed dating) the formation of teams. The activity of hacking starts on the second day and stretches until the very end before the teams present their work and the judges assess and discuss their final product.

Day 1 (5 PM - 10 PM)	Introduction & Welcome (social)	Workshop / Lecture 1 on diversity topic	Dinner (social)	Workshop / Lecture 2	Facilitated Speed Dating (social)
Day 2 (8 AM - 10 PM)	Breakfast (social)	(optional) Lecture 3 ----- Hacking	Hacking	(optional) Lecture 4 ----- Hacking	Hacking
Day 3 (8 AM - 10 PM)	Hacking	Hacking	Hacking	Presentation & Judging & Prizes	Celebration (social)

Table 1: The format of the program with more social activities (blue) planned for the first day, and optional guest lectures (yellow) given by organisers and sponsors (VUA, Booking.com, etc) and the time spent on solving the problems (green)

Hack4Her 2022: Last year's event was hosted at VUA premises and featured three exciting interdisciplinary challenges with an overarching theme of "social good for women": 1) detecting discrimination on Twitter, 2) detecting breast cancer in a provided database, 3) building a SAT solver for Sudoku. The event also hosted two invited talks from VUA researchers from interdisciplinary fields (professor in AI ethics and senior researcher on data privacy).

Hack4Her 2023: This year's event was hosted at Booking.com offices in Amsterdam. It was sponsored by the Network Institute [15] and by the Sectorplan funds from the research group [16] of the organiser. We had three exciting challenges to offer: 1) identifying optimal locations for new healthcare facilities to maximise women's access, 2) investigating how to empower women at the workplace, spread information or improve their positions in different Industries, 3) developing a solution that safeguards women's well-being in the digital realm.

More about the event here:

<https://networkinstitute.org/2023/06/20/great-success-for-the-hack4her-event/>

University news: <https://vu.nl/en/events/2023/a-technology-retreat-a-hack4her-event>

Drive 2023 (photos):

<https://drive.google.com/drive/folders/1ZgR2cwZLcBUnBJfrB58gMWt4fmggUMTG?usp=sharing>

Drive 2022 (photos):

<https://drive.google.com/drive/folders/1DJzJU0BIOBQIO-ZutaGfCYz87SzcK0b-?usp=sharing>

Evidence of its impact

This is the **first continued women-only student hackathon in the Netherlands**, and for the past five years, the only such event in the country. Radboud Women of Computing Science hosted a similar event called The Women Tech Storm in 2018 [11]. Other programming competitions (not female focused) are held at VUA campus as well as several national, european and international working groups organising various events to promote diversity and inclusion in academia (Radboud Women of Computing Science [11], EUGAIN [12], EDI IPN Working Group [13], to name a few). There are, of course, mainstream hackathons and conferences promoting female learnership organised by industries [14] in the Amsterdam area and beyond.



Figure 1: Plenary introduction (hackathon participants only) at the 2023 event

Added value for the individual participants. Students benefit from joining the event individually from several perspectives. First, it increases their **visibility on the job** market. Second, they gain **knowledge and experience** in solving a technical challenge with value to the real world. In addition, they create a **network of peers** and gain **contacts in the industry** (e.g., internships at sponsor companies). Finally, they could win a prize (museum card voucher, smart watch, e-readers, women-in-tech conference ticket, etc.). While the latter is the least valuable, it is an important motivator for the teams.

Social impact on the student population. An important change that we implemented in the 2023 edition was **opening the general program (workshops, lectures) to students of all gender identities**. This resulted in over **100 participants (overall) attending parts of the program**. It has worked very well and **increased the awareness and appreciation** of the event. Thanks to the inclusive general program, we have observed a huge increase (164% compared to 2022) in the number of interested students (161 in total) to participate in the event. Such that we were forced to implement a waiting list of up to 20+ participants, favouring women and participants intending to join the whole program. 59.6% of the interested students identified as men and 36.6% identified as women. We believe that the event has potential for a **long-term positive impact on the general student population** as we also include diversity and inclusion workshops and lectures. In addition we have received applications by participants studying different programs as shown in Figure 2 (though, CS and AI remain in majority), however we would definitely like to do better in this respect.

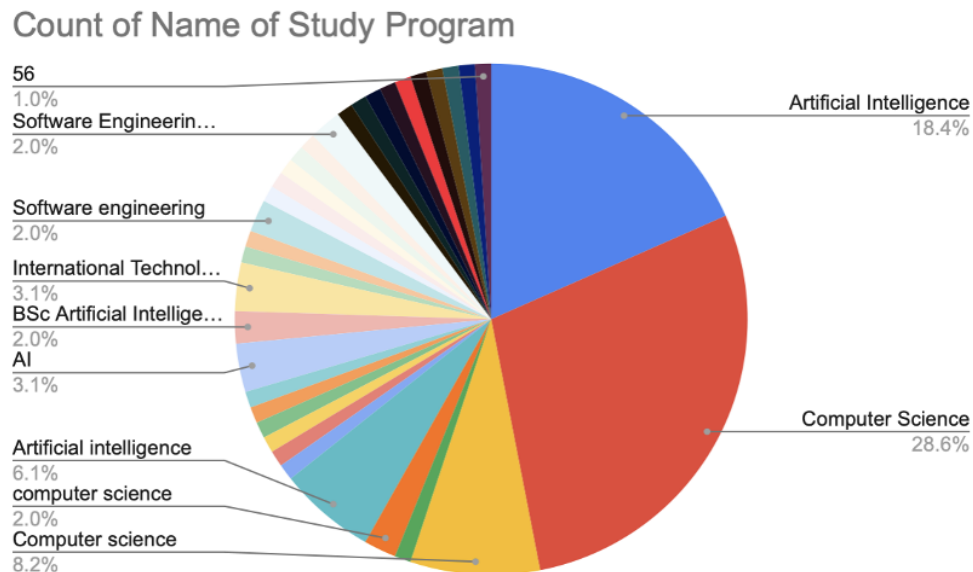


Figure 2: Study program distribution of the interested students (Note that some data entries should be merged, eg 'Computer science' and 'Computer Science'). The majority of participants were CS and AI students.

Future plans for impact. The main goals for the future are to 1) achieve participation from at least two other Dutch universities (hopefully more), 2) increase the number of participants (to 100 hackathon participants) and their background diversity. To measure them, we collect interest with an online sign-up form, and collect participants', judges' and volunteers' feedback with a Likert scale survey questionnaire.

In order to achieve our goals, we are planning to build strategic partnerships with **other Dutch Universities** (Tilburg University, TU Delft, University of Groningen, UvA, TU Eindhoven, CODAM, HvA, University of Twente). We have identified a list of staff members from these institutions that could be interested to get involved and plan to reach out. By doing so, we can both increase the number of female students that we can reach and also create a program with new topics for the workshops and lectures. Second, we plan to gather interest from **tech-industry companies** such as Uber, Bending Spoons, with which we have already started discussing the plans for next year. Finally, we want to improve the experience of the event by allowing overnight stay at the venue.

Positive feedback. The developed projects were innovative and impressive. In 2023, the judge from **Booking.com urged one team to meet with Venture Capital investors** as soon as possible. We were very excited about this great result and hope that the team will further develop their idea into a product. In addition, the students reported very positive feedback about the event. Most importantly, students reported that the **main reason for their attendance** was that the **event was "female-only"**, which is a clear indication of the need for this event. Finally, many students wish to see the event happen again next year and we are very glad to have the opportunity to encourage our strong female students to grow into high-tech professionals.

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- [15] <https://networkinstitute.org>
- [16] <https://vu.nl/en/about-vu/faculties/faculty-of-science/more-about/foundational-and-experimental-security-computer-science>

Letter of support

- Prof. dr. Patricia Lago (CS Dept. Management Team, Portfolio Research)

An indication of whether the submission can be considered as a runner up (if it does not win the award) and be included as an exemplar of best practice in future Informatics Europe publications.

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