2021 Minerva Informatics Equality Award

EPSRC Centre for Doctoral Training in Robotics and Autonomous Systems (CDT-RAS):

Female Recruitment and Retention Initiatives & Female Mentorship Programme

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Abstract

The EPSRC Centre for Doctoral Training in Robotics and Autonomous Systems (CDT-RAS) is driving a shift in the culture in terms of diversity and inclusion in the robotics research community, by implementing initiatives in the following three key areas to improve the recruitment and retention of female students: Student Recruitment, Training, and Support.

One example of these initiatives is the Female Mentorship Programme, which has been created to empower, inspire and help combat feelings of isolation, by connecting female students to inspirational women in the field of robotics and AI through seminars and mentorship sessions, complemented by networking opportunities.

Note: This 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.

Description of the Initiative

The Edinburgh Centre for Robotics (ECR) is a joint venture between Heriot-Watt University and the University of Edinburgh, with the strategic aim of supplying the urgent need for skilled, industry and market-aware researchers in Robotics and Autonomous Systems. The ECR includes the EPSRC Centre for Doctoral Training in Robotics and Autonomous Systems (CDT-RAS), which trains innovation–ready postgraduates. The CDT-RAS is driving a shift in the culture and, as a result, the diversity of the robotics research community through pro-active practices to support equality, diversity and inclusion at all levels. A principle aim is to promote wider gender diversity within the CDT and by extension in the field of RAS, by focussing on initiatives in the following three key areas described in detail below:

- Student Recruitment
- Training
- Student Retention and Support

Student Recruitment

The CDT-RAS actively encourages applications from groups who are underrepresented in the Centre, with clear guidelines for student recruitment, and all academic staff are encouraged to participate in the recruitment process. We aim to promote wider gender diversity by:

- Ensuring diversity on interview panels to make the selection process fair and transparent for all candidates.
- Monitoring marketing materials and website to ensure that they include female students and those from diverse backgrounds.
- Improving our recruitment strategy to include visits to universities by female staff, including the centre director, and female-only student open days.

Work is also ongoing to make the Centre for Doctoral Training more multi-disciplinary in order to attract students from various backgrounds - not only from robotics, but from disciplines such as psychology and cognitive sciences. These disciplines tend to have a higher proportion of women than in engineering and computer science, for example, we currently have a student from a textiles background in the CDT. The first year of training for the CDT helps students from various backgrounds train on core robotics disciplines so that they feel that they are on a level-playing field with the other students. Finally, in the second year, they complete a multi-disciplinary group project where they can exhibit their specific area of expertise but in a robotics context, thus enhancing the feeling of inclusion.

Training

We have created a culture of awareness at the Centre to increase diversity, including gender diversity, through the following training:

- Inclusive Recruitment Practice Training for CDT Centre Directors, CDT ED&I lead and the Administration team before starting the recruitment cycle for September 2021
  - after this training, we reviewed the wording on the application page of our website to make it gender inclusive, e.g. by removing phrases such as 'strong skills' which have been shown to discourage female applicants.
- Unconscious Bias Training for academics and professional support staff

- Mandatory online Diversity in the Workplace training course for all students in the first year of their PhD
- In addition, speakers at our Annual Conference and Gateway training seminars from academia and industry are selected to reflect our commitment to diversity, and there is a balance of gender within our Advisory Board

Student Retention and Support

We are supporting female students by creating an inclusive, supportive learning environment, and combating the issue of potential isolation that frequently arises from low representation in small cohorts by:

- Creating a Female Mentorship Programme to inspire and empower female students (further details in the section below).
- Improving the curriculum by including courses on subject areas such as human-robot interaction into the teaching component, which have a larger cohort of female lecturers.
- Supporting cross-cohort activities, cross-CDT events and links to the wider PhD student communities within the institutions, which have sufficient mass to overcome the issue of isolation.
  - Examples of this include the International workshop on Artificial Intelligence and Mental Health hosted by the SOCIAL AI CDT at the University of Glasgow, and the Annual student conference held jointly with the Robotics CDTs in Bristol (FARSCOPE), Edinburgh (RAS) and Oxford (AIMS).
- Providing female-only events such as hackathons, and support groups, such as Women in Robotics Edinburgh (WiRE).
- Implementing a personalised Technical Learning Portfolio approach to provide students with a flexible working pattern thus maximising retention for students with personal circumstances e.g. for carers or those with health-related issues.

Female Mentorship Programme

The CDT-RAS Female Mentorship Programme was created to empower and inspire female students and to help combat feelings of isolation. It supports the student-led WiRE (Women in Robotics Edinburgh) group, and was set up in response to the WiRE Group identifying a need for advice and guidance. The WiRE group was created by female CDT students, but now has members outside of the CDT and is thus an example of how the CDT has encouraged inclusivity outside of the centre.

The Mentorship Programme connects CDT-RAS female students to inspirational women in the field of robotics and AI through seminars and mentorship sessions, complemented by networking opportunities such as the OGTC TechX Ideas Club Community. We currently have three mentors involved in the Programme, with more in the pipeline:

o Kavita Kapoor, founder of the Federation of Humanitarian Technologists
o Dr Stephanie Earp, Co-founder and Technical Director at Optic Earth
o Dr Karen Donaldson, PDRA in the Soft Systems Group at the University of Edinburgh, STEM Learning UK Ambassador, and Launch Co-ordinator for the Molly Fergusson Initiative

Examples of Impact

Recruitment and retention of female students has increased year on year from 2017, and **female students make up 33% of the 2020 cohort**. All of the female students recruited in 2019 and 2020 have remained on the course. This is high compared to the statistic that 19% of students studying Engineering and Technology, and Computer Science related subjects are female (UCAS data 2019), and that just 11% of the UK engineering and technical workforce are female (Institute of Engineering and Technology, Skills and Demand in Industry 2019 Survey).
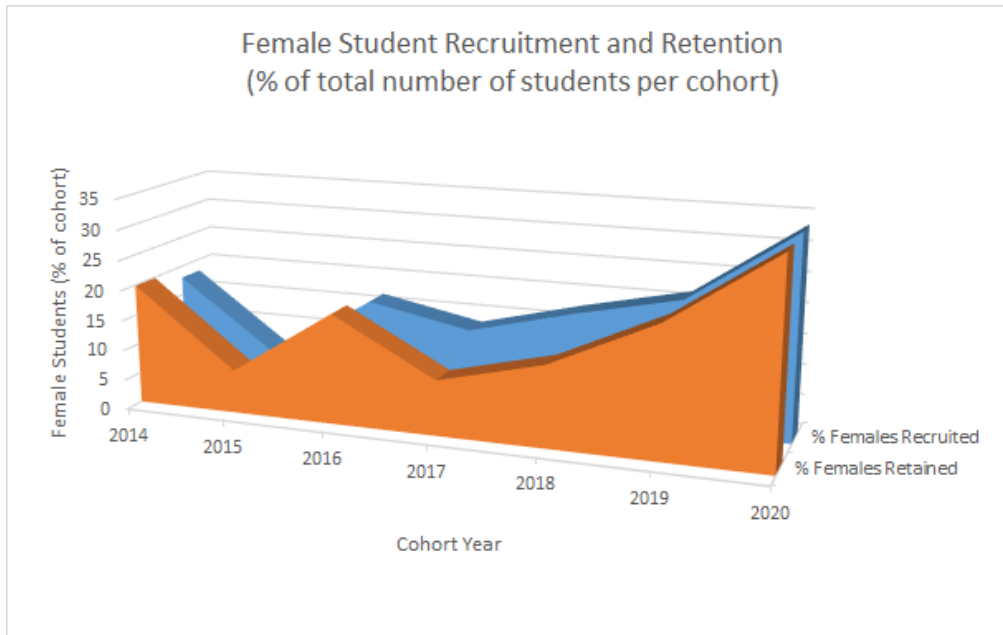

Fig 1: Graph of Percentage of Female Student Recruitment and Retention by cohort

Success stories include one of our female students from the 2014 cohort, Dr Raluca Scona, graduating from the CDT-RAS as one of only two students to date to graduate from this cohort. She is now working as a Dyson Fellow at the Dyson Robotics Lab. A second female student from our 2015 cohort, Tatiana Lopez, is about to graduate and has already secured a place at Deepmind.
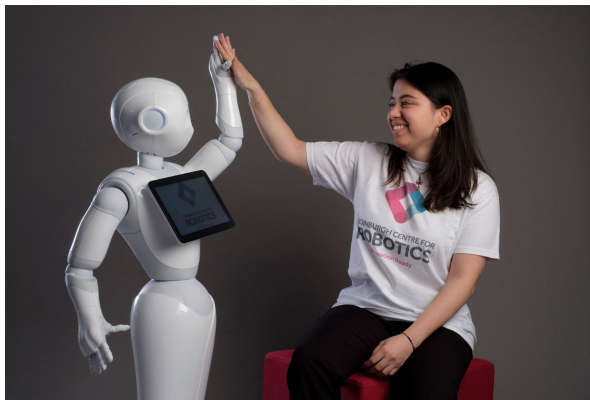

Fig 2: CDT-RAS Student Tatiana Lopez with Pepper, a social humanoid robot.

Dr Raluca Scona gave the following feedback about her time at the CDT-RAS:

"I did my PhD in the CDT at the Edinburgh Center for Robotics between 2015 and 2019. During this time, students in the CDT formed the WiRE support group for female students. With our group, we would meet to discuss our experiences in the CDT and offer advice or support. Aside from this support group, the students of my cohort would also meet either to socialise or to offer support. We also had a cohort student representative who would attend meetings with the CDT executive to raise issues relevant to our cohort. Overall, these groups helped me feel included and I was able to easily find a peer to talk to during my time there."

Dr Raluca Scona, CDT-RAS Graduate and Dyson Fellow at the Dyson Robotics Lab

The Female Mentorship Programme has been very well received with positive feedback from both the seminars and mentorship sessions. The student-led WiRE (Women in Robotics Edinburgh) group, which the Mentorship Programme supports, was created by female CDT students but now has members outside of the CDT, and is an example of how the CDT initiatives have had an wider impact. Feedback on the Female Mentorship Programme is typified by the quote below:

"The WiRE Female Mentorship Programme provides us with a great opportunity to meet other women in the field and gives us a safe space for discussion and support. The seminars from women in tech leadership positions are insightful. It is encouraging to see the varied career paths that speakers have taken and learn about how they have overcome obstacles they faced along the way. The mentorship sessions also give us a great opportunity to get advice from others, share our own experiences and learn from the experience of other women."

Mhairi Dunion, CDT-RAS PhD Student 2020 cohort and Female Mentorship Programme Mentee

Letters of Support

Kavita Kapoor, Strategy and Executive Director Federation of Humanitarian Technologists, and Female Mentorship Programme Mentor

It gives me great pleasure to write this letter in support of the CDT-RAS Female Mentorship Programme. As a mentor on the program, I see first-hand how the initiative empowers and inspires female and gender non-binary students who may otherwise feel isolated.

The programme supports the student-led WiRE group (Women in Robotics Edinburgh). The group comprises of talented students focused on cutting edge research. Alongside them, I have had the privilege of working closely with Claire Ordoyno who makes the entire operational delivery, engaging with the students remotely, frictionless and a delight.

By connecting CDT-RAS female and non-binary students to inspirational women in the field of robotics and AI, the programme is changing perceptions and challenging the normal stereotypes back in our organisations creating a new level of playing field for diversity and inclusion. Recognising this excellent program will elevate the network we are creating even further.