Women In Robotics

Robotics Policy Group
Department of Industry, Science and Resources

E. robotics@industry.gov.au

7th May 2023

Dear Robotics Policy Group

We write in response to your request for submissions on the Australian government's Discussion Paper on a National Robotics Strategy.
'How to improve diversity' is *absolutely* the right question to ask amidst the harrowing skills crisis in Australia, where talent retention is key to the survival of industries. McKinsey's data[1] shows that women are switching companies in *unprecedented* numbers to get what they want from work, and in today's global employment economy, that very easily includes moving overseas to get it. It's *critical* for Australia as a nation to be proactive against the "Brain Drain" of talented women, and likewise against attrition of "atypical roboticists" at *all* career stages. As a group of renowned technical women with insight into the Australian robotics industry, we are glad to shed light on motivations and strategies to that effect.

Women in Robotics is an international 501c3 community for women working in robotics, or women who aspire to work in robotics, both in industry, government and academia. Formally founded in 2019, **Women in Robotics** (WiR) has local groups in 16 countries and more than 1,950 members online, for mentorship, career building opportunities, information and support.

Every year since 2013, **Women in Robotics** publish a global list of "*Women in Robotics you need to know about*". Starting with 25, the list has grown to 50, with women from more than 20 countries celebrated. Seventeen women from Australia have been recognised on the list and it is on their behalf that we submit a response to Australia's National Robotics Strategy Discussion Paper.

[1]https://www.mckinsey.com/featured-insights/diversity-and-inclusion/women-in-the-workplace

We welcome the Australian Government's timely development of a National Robotics Strategy to promote the responsible production and adoption of robotics, AI and automation technologies. We agree that there is immense potential for Australian industries across the economy to benefit from these technologies and for Australia to become a significant producer of these. The Australian robotics industry would benefit from improved diversity, and we would like to propose some recommendations in the area of gender diversity, as this is the area **WiR** was intentionally created to support. We address the relevant question in the strategy discussion paper,

"How can Australia improve the diversity of its robotics and automation workforce and better include under-represented groups?"

Why is diversity important?

"*Gender equity doesn't only benefit the minority gender. It benefits everyone.*[2]" The focus of this submission is on gender equity, as it directly impacts 50% of the Australian population and can have flow on benefits (e.g., workplace flexibility) to the other 50%. One of the main challenges confronting robotics companies across the world is access to talent. For Australia to build a competitive and sustainable robotics industry, it needs to be an attractive working environment for 100% of the population, not just the <50% who identify as men.

There are other reasons to ensure diversity in the field. Gender stereotyping and lack of inclusivity and diversity both in robots themselves (e.g., cleaning robots with female names) and in the robotic industry, permeates our perception and reception of robots and fundamentally limits their usefulness if they are designed exclusively by one gender. In addition, lack of diversity in the disciplines contributing to the physical and behavioral design of a robot, restricts the type of problems that robots are designed to solve, which in turn makes the field of robotics less attractive for women to participate in and less useful to society in general. Greater participation will ensure that robots achieve more social impact than is currently possible.

[2]Barnes, S. & Kingsley I. (2023). Workplace gender equity guide. Office of the Women in STEM Ambassador, Sydney https://womeninstem.org.au/ https://womeninstem.org.au/workplace-equity/

Women face many barriers to participating in science, technology, engineering and mathematics (STEM) education and only 1 in 10 women with a STEM qualification work in a STEM-qualified field[3][4]. Our submission covers the career lifecycle from early education through to career advancement and workplace retention and progression. Many of the observations and recommendations we make are true for other marginalised groups and in similarly male-dominated industries/sectors.

Background

Australian society has a very gendered perception of the suitability of men and women to different occupations, reinforced by biases in media coverage and workplace discrimination[5]. According to the Turing Institute[6], stereotypes influence girls' lack of confidence in their own abilities, and can discourage girls from engaging with mathematics and science. This 'pipeline problem', however, is only one part of the issue, there is a troubling and persistent problem with retention of women in robotics and robotics-related fields and, according to STEM Equity monitor[7], five years after graduation over 70% of STEM-qualified women won't be working in a STEM qualified occupation, which is a local form of brain drain. The US National Centre for Women and Information Technology found that women leave technology jobs at twice the rate of men[8]. The bottom line is that we are not retaining the small number of women who do enter male-dominated technology fields such as robotics.

According to the Turing Institute, "The 'chilly', unwelcoming climate of the tech workplace, both physically and online, is a central contributor to *the high attrition rates of women away from the data science and AI*

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[3] Corrigan, D., & Aikens, K. (2019). Barriers to participation in engineering and the value of interventions to improve diversity. Monash University. https://educationfutures.monash.edu/newsevents/barriers-to-participation-in-engineering-a-report-for-the-engineering-for-australia-taskforce

[4] Australian Government. (2022). STEM Equity Monitor Data Report. Department of Industry, Science and Resources. https://www.industry.gov.au/sites/default/files/2022-09/stem-equitymonitor-data-report-2022.pdf

[5] Tofts-Len, S. & Barker, A. (2023) Occupational gender segregation. CEDA White paper. https://www.ceda.com.au/ResearchAndPolicies/Research/Workforce-Skills/Employment-white-paper-submission#tab6

[6] https://www.turing.ac.uk/research/research-projects/women-data-science-and-ai-new

[7] https://www.industry.gov.au/publications/stem-equity-monitor

[8] Ashcraft, C., McLain, B. & Eger, E. (2016) Women in Tech: The Facts https://wpassets.ncwit.org/wp-content/uploads/2021/05/13193304/ncwit_women-in-it_2016-full-report_final-web06012016.pdf

professions, as well as the differentiation of AI professional's career trajectories by gender (e.g. Hicks, 2017). This climate can include gender pay gaps, slow career progression for women, sexual harassment, male-dominated office culture and gender bias in hiring, all of which discourage women from continuing their careers in the fields."

Tackling the gendered workplace also means considering how to increase the number of men in female-dominated fields. The interventions required to address this issue are quite different[9] to those that are the subject of this submission, however are important in addressing how "women's" work is undervalued and has lower status in our society. Ultimately we should aspire to equal representation of genders across all industries.

Which interventions work to increase the number of women in robotics and related fields?

We hope the government's current "Diversity in STEM review"[10] will shed some light on this vexed topic. Very few models of success are available. Two successful exceptions are the US universities Carnegie Mellon[11] and Harvey Mudd[12], which have dramatically increased the participation of women in their computer science departments through strong commitment from senior management. However the reach of these institutional programs has not been replicated at scale, and will require significant government investment. Both the US National Science Foundation ADVANCE program[13] and the Natural Sciences and Engineering Research Council of Canada's Women in Science and Engineering Chair programs[14] are notable success stories in the academic arena. The NSERC program raised visibility of the importance of increasing participation by

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[9] Stopgappers? The Occupational Trajectories of Men in Female-Dominated Occupations, Work and Occupations, Vol. 45, Issue 3, 2018 https://journals.sagepub.com/doi/abs/10.1177/0730888418780433

[10] Diversity in STEM review https://www.industry.gov.au/science-technology-and-innovation/diversity-stem-review

[11] Frieze, C. & Quesenberry, J.L. How Computer Science at CMU is attracting and retaining women, Communications of the ACM, v. 62(2) 23-26. https://cacm.acm.org/magazines/2019/2/234346-how-computer-science-at-cmu-is-attracting-and-retaining-women/abstract#:~:text=Women%20comprised%20more%20than%2048,and%20graduating%20women%20in%20CS.

[12] Klawe, M. (2013) Increasing female participation in Computing: The Harvey Mudd College Story https://www.cs.unm.edu/~learningcomputing/readings/13_klawe.pdf

[13] https://www.nsf.gov/crssprgm/advance/

[14] https://www.nserc-crsng.gc.ca/Professors-Professeurs/CFS-PCP/current-actuelles_eng.asp#:~:text=The%20Chairs%20for%20Women%20in,considering%2C%20careers%20in%20these%20fields.

women in science and engineering[15], while the >USD$315m ADVANCE program has funded more than 100 different institutions to support systemic change projects that enhance gender equity and inclusion for STEM faculty, generating new knowledge and strategies[16]. The NSF also supports a range of additional measures to facilitate networking, support and inclusion to broaden participation in the STEM academic workforce[17].

In response to the poor representation and retention of women in robotics, **WiR** has taken the following three proactive steps, which we encourage supporting to help raise the visibility of womens' contributions to the field of Robotics:

1. **WiR Photo Challenge** - part of WiR's Project Inspire, getting better representation of diversity in the images we use to portray robotics and the people who work in the field[18].
2. **WiR Global annual list** - part of WiR's Project Inspire and celebrated on Ada Lovelace Day, WiR compiles a list of women in robotics that everyone should know about[19].
3. **WiR local chapters and mentoring programs** - WiR has two fledgling chapters in Australia and has not activated a mentoring program, although one is currently active in the US.

There is strong evidence that women receiving peer mentoring by women in STEM leads to positive outcomes and greater retention of women in the field[20]. However, the structure of the mentoring programs is crucial to their success, with Reynolds (2023) finding that, "*Those without mentors and with male mentors showed a decline in confidence from entry to college through to*

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[15] Williams, F & Klawe, Maria & Cannon, Elizabeth & Deschênes, Claire & Frize, Monique & Muir, Barbara. (2002). The NSERC/Industry Chairs for Women in Science and Engineering: A National Program in Canadian Universities.

[16] DeAro, Jessie & Bird, Sharon & Mitchell-Ryan, Shermaine. (2019). NSF ADVANCE and gender equity: Past, present and future of systemic institutional transformation strategies. Equality, Diversity and Inclusion. 38. 131-139. 10.1108/EDI-09-2017-0188.

[17] https://www.nsf.gov/eng/diversity.jsp

[18] https://robohub.org/join-the-women-in-robotics-photo-challenge/

[19] https://www.womeninrobotics.org/annual-list/

[20] Reynolds, Emily (2023) Female peer mentors have long-lasting positive impact on female STEM students, British Psychological Society https://www.bps.org.uk/research-digest/female-peer-mentors-have-long-lasting-positive-impact-female-stem-students

graduation and beyond". Funding to support quality evidence-based mentoring programs is hard to find, although there are some notable general mentoring successes, e.g., the Australian Academy of Technological Sciences and Engineering (ATSE) IMNIS program[21] and Science and Technology Australia's Superstars of STEM program[22].

Policy interventions identified by the Turing Institute include the need for proactive steps to ensure the inclusion of women and marginalised groups in the design and development of technologies, which includes disclosure and scrutiny of the current available data and gender composition of companies' technical, management and applied research teams[23]. **Women in Robotics** advocates for the application of "pull" initiatives that encourage and support women in STEM fields by creating welcoming and inclusive work environments rather than "push" initiatives, which may result in poor retention, although both push and pull initiatives can have their place.

We provide some intervention recommendations from the collective experience of **Women in Robotics** across the robotics career life-cycle:

Primary and Secondary School

It is important to note that girls' awareness and self-efficacy towards math, engineering and computer science careers is set early - often before they leave primary school. Therefore to capture girls' interests and ensure that we don't leave half of the population disenfranchised by STEM, we need to intervene in early and middle school. Sadly many girls in Australia say they don't know what engineering is and what engineers do and don't consider it a valid career option[24]. Engineering and computer science are good proxies of the technical career pathway into robotics.

Teachers are a key driver towards changing girl's self-view of their Mathmatics, Engineering and Computer Science competencies. We must always challenge the idea that girls "choose" not to pursue STEM subjects that could create a pathway into robotics when societal gender norms guide career

[21] https://www.atse.org.au/career-pathways/imnis/
[22] https://scienceandtechnologyaustralia.org.au/what-we-do/superstars-of-stem/
[23] https://www.turing.ac.uk/research/research-projects/women-data-science-and-ai-new
[24]https://www.engineersaustralia.org.au/sites/default/files/women-in-engineering-report-june-2022.pdf

decisions by women and their families[25]. Teachers themselves often lack awareness, expertise and confidence in computational thinking skills and how to teach relevant developmentally appropriate robotics activities. This can undermine the success of programs in robotics and coding, and **WiR** advocates for additional support and training for teachers in technical areas such as robotics[26][27][28].

As a much-needed supplement to teachers, several not-for-profit groups, focussed on raising awareness of and diversity within STEM, have emerged that provide services to schools. The lack of sustainable funding pathways for these groups mean they are often reliant on government grants to provide services or corporate sponsorship. These insecure funding sources are always at risk of losing the capability and connections within the school community that they develop. **We recommend that the government support the implementation of *sustainable* business models that have already been shown feasible for these important outreach programs.**

Recognising the benefits that sponsorship plays for their company's talent attraction, savvy industry players *choose* to fund outreach programs across the entire pipeline from school through university and beyond. For example, industry partners including Commonwealth Bank, Thales and Lendlease fund the WiEIT school outreach program that is then *implemented* by the University of Technology Sydney[29] employees funded through the sponsorships. There is a business motivation for industry partners, UTS, and schools alike to participate in this symbiotic exchange. Similarly ATSE's Wonder of Science program[30] is now supported by industry sponsorship in Queensland only. Let's replicate the STEM initiatives that work driven by a consolidated overarching body like the Australian Government, and let's ensure the representation of robotics and other fields critical to Australia's growth, while we're at it.

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[25] https://www.unicef.org/media/84046/file/Reimagining-girls-education-through-stem-2020.pdf

[26] Chalmers, Chris (2018) Robotics and computational thinking in primary school. International Journal of Child - Computer Interaction, 17, pp. 93-100.

[27] https://research.acer.edu.au/cgi/viewcontent.cgi?article=1028&context=policy_analysis_misc

[28] https://link.springer.com/article/10.1007/s10798-019-09542-4

[29] https://www.uts.edu.au/about/faculty-engineering-and-information-technology/women-engineering-and-it/opportunities/partner-uts-women-engineering-and-it

[30] Tomas, L., Jackson, C., and Carlosle, K. (2014) The transformative potential of engaging in science inquiry-based challenges: the ATSE Wonder of Science Challenge, Teaching Science. Australian Science Tea cjers Association 60(2), pp. 48-57.

It is not our intention to repeat the findings of many good studies on the barriers and potential solutions to STEM participation by girls that have already been identified by groups such as Engineers Australia[31]. One issue that is fairly unique to robotics is the prevalence of competitions that are used to promote general interest in robotics. While there is some evidence that robotics courses may increase girls' interest in STEM careers, there are still inherent gender biases that need to be overcome in these competitions[32]. There is also evidence that girls are motivated by solving real-world problems in collaboration with others rather than in competition e.g., STEAMpunk Girls Program[33] and FIRST[34], as opposed to sumo robot competitions[35]. The diversity success of these programs needs to be clearly established.

Higher Education (TAFE, University undergraduate and postgraduate degrees)

For the relatively small number of women that enrol in STEM fields, particularly engineering and computer science, the motivation of women to study subjects with social impact is evident. As an industry, robotics (and engineering more broadly) has an image problem where the *impact* of robotics is not resonating with passionate young people. Robotics careers aren't perceived as "helpful" enough to win out over other careers. Anecdotally, at universities where mechatronics and medical engineering are offered as subject specialties, there is only 5% representation of women in mechatronics degrees, but in medical engineering, representation is at the 50% level. Connection to impact matters. We would like to see **WiR**'s efforts amplified to highlight *tangible real-world examples* of robotics role models' careers and their *impact on society.*

Apart from evidence-based interventions like those previously mentioned being deployed at Carnegie Mellon University and Harvey Mudd College in the US that we could look to replicate in Australia, some Australian universities are

[31]Women in Engineering June 2022, Engineers Australia. https://www.engineersaustralia.org.au/sites/default/files/women-in-engineering-report-june-2022.pdf

[32]Witherspoon et al (2016) Gender, interest, and prior experience shape opportunities to learn programming in robotics competitions, International Journal of STEM Education. https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-016-0052-1

[33]Ng, W. & Fergusson, J. Women and interdisciplinary STEAM education https://files.eric.ed.gov/fulltext/EJ1268318.pdf

[34]https://www.firstinspires.org/sites/default/files/uploads/resource_library/impact/stem-boosting-engagement.pdf

[35] https://www.robocupjunior.org.au/challenge-regions/sa/sa-sumo-challenge/

experimenting with women-only tutorial groups in computer science (Melbourne University) and a variety of mentoring programs, however the demands placed on more senior women to provide mentoring needs to be recognised and rewarded, as well as the potential pitfalls of supplying male mentors[36], while finding ways to engage allies amongst the majority members of the robotics community with initiatives such as the student-led Pink Rover[37].

Black in Robotics (US)[38] is leveraging supported scholarships followed by guaranteed internships very successfully for underrepresented students. Indigenous or first-in-family university students need additional financial support and mentorship, while guaranteed placements helps transition minority students to the workforce and helps increase participation rates.

In general, more pathways into robotics need to be established for mature and non-traditional students. At the moment it is very hard for someone who didn't have the foresight to choose physics and mathematics in high school to retrain for a technical robotics career later in life. The lack of non-traditional pathways into the industry likely disproportionately affects women.

Early and Established Career Stages

There is clear evidence that women entrepreneurs receive only 3% of available investment funds compared to men across all sectors, not just robotics[39]. The government's female founders grants are a positive step to alleviate this issue, although do run the risk of companies engaging in diversity-washing[40] to access such funding schemes. **WiR** recommend:

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[36]Reynolds, Emily (2023) Female peer mentors have long-lasting positive impact on female STEM students, British Psychological Society

[37]https://www.monash.edu/engineering/about/news/articles/2023/nova-rover-turns-pink-to-spark-conversations-about-women-in-stem
https://www.novarover.space/pinkrover

[38] https://blackinrobotics.org/

[39]https://womensagenda.com.au/latest/eds-blog/just-3-per-cent-of-vc-funding-went-to-all-women-founded-startups-in-2022/

[40] Baker, Andrew and Larcker, David F. and McClure, Charles and Saraph, Durgesh and Watts, Edward, Diversity Washing (December 9, 2022). Chicago Booth Research Paper No. 22-18, Rock Center for Corporate Governance at Stanford University Working Paper No. 151, Stanford University Graduate School of Business Research Paper No. 4298626, European Corporate Governance Institute – Finance Working Paper No. 868/2023, Available at SSRN: https://ssrn.com/abstract=4298626 or http://dx.doi.org/10.2139/ssrn.4298626

- further interventions be considered to increase the capital pool available for women-led and diversity-focussed robotics companies and that this is tracked through time to show if improvements are made
- that consideration be given to how “diverse” enterprises are recognised, e.g., relative within-year ranks of workplace diversity and the amount of Diversity, Equity and Inclusion (DEI) commitment disclosures[23]

Numerous interventions at all career stages can help to promote diversity. The government can support companies to implement these interventions through incentives, reporting and also by setting expectations. Top down messaging that the robotics industry must welcome women and diversity to be able to do business in Australia and to secure government contracts. The US government requires diversity reporting and prioritises contracts from women-owned or minority-led companies. Government leadership on this issue is important to motivate companies to do better/get involved, in the nation's overall interest, as well as reducing the burden on minority groups to advocate and provide most of the support mechanisms as groups like **WiR** currently do. As diversity measures improve, messaging should focus on the benefits of diversity and inclusion as selling points for companies to attract talent and as a competitive advantage for Australia (if achieved).

Culture change can further be incentivised if the government does not fund or support attendance by government employees (or organisations receiving significant government funding) at events that do not demonstrate diversity. Diversity at such events needs to be visible through inclusion of women keynotes, women chairs, diversity in selection committees, and the event needs to have a published D&I policy with zero tolerance of harassment and clear guidelines on what constitutes harassing behaviour towards women and minorities.

The government can also play an important role in raising the visibility of women in robotics, and women in male-dominated fields more broadly, ensuring that the images used by the government include women conducting technical work, not just standing next to or watching a man work on hardware.

In Australia 99.5% of parental leave is taken by mothers[41]. Encouraging men to take parental leave and share the burden of care-giving should be a key priority. Recognising the detrimental impact on careers that gender-biased care giving entails, there is a need for initiatives that selectively support care-givers, such as affordable childcare and child-minding support to access professional development opportunities such as courses or conferences. For women in academia, the existence of Women only Travel grants and exchange programs can help, for example the Marie Curie actions funding, which includes travel, fellowships, etc. for women[42].

To encourage retention of women in the robotics field and make robotics workplaces more welcoming, **WiR** endorse the Implementation Guide for Workplace Gender Equity[43] developed by the office of the Women in STEM ambassador. We further suggest focussed attention be placed on recruitment and retention, with the government influencing the adoption of "balanced" shortlist strategies that require equal numbers of qualified women and men be considered for positions, consistent with research that shows one woman on a shortlist is insufficient[44]. For retention, the low current numbers of women in the field result in it being very difficult for experienced women to gain high level champions and mentorship compared to men, which is a distinct disadvantage to their careers. We further endorse the range of recommendations made by CEDA in their report on occupational gender segregation[45].

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[41]Tofts-Len, S. & Barker, A. (2023) Occupational gender segregation. CEDA White paper. https://www.ceda.com.au/ResearchAndPolicies/Research/Workforce-Skills/Employment-white-paper-submission#tab6

[42]https://www.iua.ie/press-releases/the-impact-of-marie-sklodowska-curie-actions-funding-on-the-careers-of-female-researchers-international-womens-day-2021/

[43] Barnes, S. & Kingsley I. (2023). Workplace gender equity guide. Office of the Women in STEM Ambassador, Sydney https://womeninstem.org.au/ https://womeninstem.org.au/workplace-equity/

[44] Johnson, S.K., Hekman, D.R. & Chan, E.T. (2016) If There's Only One Woman in Your Candidate Pool, There's Statistically No Chance She'll Be Hired. Harvard Business Review. https://hbr.org/2016/04/if-theres-only-one-woman-in-your-candidate-pool-theres-statistically-no-chance-shell-be-hired

[45] Tofts-Len, S. & Barker, A. (2023) Occupational gender segregation. CEDA White paper. https://www.ceda.com.au/ResearchAndPolicies/Research/Workforce-Skills/Employment-white-paper-submission#tab6

General Recommendations

Primary and Secondary School

- Intervene in early and middle school to promote an awareness of robotics to girls.
- Engage with teaching staff by providing information on STEM pathways into robotics.
- Develop sustainable business models for schools' outreach programs.
- Consolidate STEM initiatives and ensure proportionate focus on robotics.
- Provide support for better STEM training of teachers and improve STEM curriculum to reflect today's real world impact of robotics.

Higher Education

- Highlight real world career examples of inspirational women in robotics and their positive impact on society.
- Recognise and reward the mentoring contribution of senior women in the field of robotics.
- Establish more pathways into robotics for mature and non-traditional students.

Early and Established Career

- Increase the capital pool available for women-led and diversity-focussed robotics companies.
- Consider how "diverse" enterprises are recognised based on workplace diversity and DEI commitments.
- Increase government support for companies to implement DEI intiatives.
- Active messaging from leaders that the robotics industry must embrace women and diversity.
- Improve visibility of diversity in prestigious events by including women in prominent roles.
- Raise the visibility of women in robotics by government use of contemporary images showing women in active technical roles.

- Encourage men to take parental leave and share the burden of caregiving.
- Selectively support caregivers to access professional development opportunities.
- Adopt women positive recruitment policies to support employment and retention of women in robotics.

Case Studies

Deanna Hood, Young Engineer of the Year 2022, "Company culture can absolutely be a draw card in winning the "talent war". People are less and less tolerant of work getting in the way of who they are - I've heard from Muslim friends that they choose not to work for companies without a prayer room, for example. I personally moved back to Australia from Silicon Valley to work at a startup because there I could work part-time and with an engineering team of 40% women (at the time). For top talent, how work integrates with our holistic selves is increasingly the deciding factor in where we choose to stay. I personally moved overseas for my career because of (successful!) incentives by the European Commission and USA to attract tech talent. If Australian companies get inclusive culture right here, it can mean that as a country we can attract talent home, as well as others born overseas. Given the absolutely critical talent shortage, this should be what motivates companies to do better - to stand out to successful women like the ones on this submission, rather than making the talent shortage even worse for themselves."

"The IEEE Robotics and Automation Society has recognised the importance of D&I in robotics[46]. In 2015, its flagship conference, International Conference on Robotics and Automation (ICRA), featured an all female organising committee. That year, we also saw many new events at ICRA to attract female and minority students to robotics, including "Becoming a Robot Guru" for college students mentoring and an innovative Go, Girl, Go! to attract younger students[47]. In 2022, ICRA organisers collaborated with researchers in countries that have not been well represented in international robotics conferences to understand

[46] *Graesser, et.al., Gender Diversity of Conference Leadership, IEEE Robotics & Automation Magazine, Vol. 28, Issue 2, 2021*
[47] https://web.eecs.utk.edu/~leparker/publications/RAM-ICRA-2015-report.pdf

barriers and work together to alleviate these barriers. As a result, 97 countries participated in ICRA 2022. While acknowledging that much further work on D&I is needed, these two examples indicate that deliberate actions are indeed required to improve D&I in robotics.” [Source: Hanna Kurniawati, ICRA’15 Student Activities Co-Chair and ICRA’22 Program Co-Chair]

Women In Robotics

Australians on the Women in Robotics global annual list of "Women in Robotics you need to know about"

Catherine Ball, Co-Founder Future Metaverse Conference and World of Drones and Robotics, Author of Converge.
Teresa Vidal Calleja, Associate Professor & Research Director at UTS: Robotics Institute, Treasurer Australasian Robotics and Automation Association
Elizabeth Croft, Vice-President Academic & Provost at the University of Victoria, Canada
S. Kate Devitt, Chief Scientist Trusted Autonomous Systems Defence Cooperative Research Centre
Deanna Hood, 2022 Australian Young Professional Engineer of the Year
Anjali Jaiprakash, Deputy Director of the Centre for Biomedical Technologies, QUT. Chief Investigator of the Australian Cobotics Centre
Andra Keay, Founder and President, Women in Robotics, MD Silicon Valley Robotics, VP Global Robotics, AMT
Sue Keay, Robotics Technology Lead, OzMinerals; and Chair of the Robotics Australia Group
Dana Kulic, Professor & Director of the Robotics Research Group, Monash University
Hanna Kurniawati, Professor & SmartSat CRC Chair in System Autonomy, Intelligence, and Decision-Making, School of Computing, Australian National University
Wendy Moyle, Professor & Program Director, Healthcare Practice and Survivorship, Menzies Health Institute QLD, and SONM, Griffith University
Nicci Rossouw, Founder Exaptec, Let's Talk Robotics podcast and WiR Melbourne Chapter.
Pauline Pounds, President Australasian Robotics and Automation Association, Associate Professor School of Information Technology and Electrical Engineering, The University of Queensland.
Mari Velonaki, Professor and Director of the Creative Robotics Lab UNSW, Founder and Director of the National Facility for Human-Robot Interaction Research (UNSW, USYD, UTS St Vincent's Hospital).
Janet Wiles, Professor in Human Centred Computing at the University of Queensland and leads the Future Technologies Thread of the ARC Centre of Excellence for the Dynamics of Language (CoEDL)
Mary-Anne Williams, Michael J Crouch Chair for Innovation at UNSW

Our vision:

Women in Robotics is a global community supporting women who work in robotics and women who are interested in working in robotics, as entrepreneurs, industry and academia. Our activities include local networking events, outreach, education, mentoring and the promotion of positive role models in robotics, both in research, industry, entrepreneurship and just plain fun.

Our mission:

The mission of Women in Robotics is to support women who work in robotics and women who are interested in working in robotics.