

Retrospective on a Watershed Moment for IEEE Robotics and Automation Society Gender Diversity

By Elena Delgado and Lydia Tapia

The last “Women in Engineering” (“WIE”) column presented the results of a multiyear study into gender diversity in IEEE Robotics and Automation Society (RAS) conference leadership and top speaking positions from 2002 to 2018. The findings were stark: during that period, gender diversity in RAS

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conference leadership and speaking positions increased at a rate of only 1% per year, with women now holding about 20% of those roles. However, the surprising and somewhat hopeful take-away was that this increase was primarily achieved from 2013

to 2018. That led us to ask, What happened in that timeframe to promote this?

Pinpointing what social changes occurred in robotics five years ago is difficult. However, at the time, more women were becoming involved, and there was an event that may have driven the change: the 2015 IEEE International Conference on Robotics and Automation (ICRA). That ICRA was unlike any other robotics conference before in that



Lynne Parker, current director of the National Artificial Intelligence Initiative Office, assistant director of Artificial Intelligence, and general chair of the 2015 ICRA.

it was entirely led by women. The numbers in the WIE diversity report tell us this was revolutionary: the number of women in leadership and speaking positions in 2015 more than doubled compared to any RAS-supported conference in any previous year. The data also showed that a small pool of primarily male individuals had previously held leadership and speaking positions multiple times.

To provide perspective on this watershed moment in gender diversity, we interviewed the organizers of the 2015 ICRA, Lynne Parker and Nancy Amato, and the originator of the idea for an all-women-led conference, C.S. George Lee. We wanted to understand why they agreed to such a radical idea, how challenging it was to implement, what impact they hoped for, and what they thought the future held. We learned that prior to the organization of the 2015 conference, the environment



Nancy Amato, head of Computer Science at the University of Illinois at Urbana-Champaign and program chair of the 2015 ICRA.



C.S. George Lee, professor of Electrical and Computer Engineering at Purdue University.

for women was definitely not inclusive but not as hostile as the 11% average rate of women in robotics leadership roles worldwide would indicate. Those in leadership positions were not prioritizing finding new people, especially not



The welcome banner for ICRA 2015 at the Washington State Convention Center.

new women, to organize conferences, which hampered efforts toward gender diversity prior to the 2015 event. The timeline shared by our interviewees for conversations about a women-led RAS conference directly correlates to the increase in women in leadership roles in RAS-sponsored conferences, from ~4% in 2012 to ~22% in 2018. All signs point to the idea that simply starting conversations about this diversity problem led to increased awareness and spurred people to action.

As we stated, the original idea for an all-women-led ICRA originally came from Lee, a professor at Purdue University and veteran conference organizer who was originally going to be general chair of the 2015 event. He began talking about the idea of an all-women-organized conference with Parker and Amato as early as 2010. At first, both were hesitant about the concept and not convinced it was a good idea. They were “actually quite worried that there would be backlash from the community, especially because the community was male-dominated. Playing a role in these things is important for people’s careers, and we were going to take all of these



Attendees listen to a talk.

organizing roles and give them to women.” They remembered that “some, a very tiny number of people, brought up the opinion that we ought to be mirroring what we think all conferences should be doing ... that it should be balanced. So not all women, but 50–50 women and men.” Over time, they found the idea more “intriguing” as an opportunity to train more women in conference organization roles, and Lee transferred the leadership positions to them in 2012.

Leading up to the 2015 ICRA, the general climate for women in robotics was not outright hostile but could be isolative and unfriendly. Parker and Amato recounted times when they were the only women in organization committee meetings and instances at panel events where “certain questions were asked pointedly to the only woman on the panel.” They also spoke of an “old boys’ network,” or “old roboticists’ network,” that was almost exclusively male, and noted that “when it comes to conference organizing activities, frequently, people invite their friends, they invite people they’ve worked with in the past.” Lee has been in the field since the late 1970s and admitted that most of the people he knew and worked with in his early days were men.

Parker conjectured that the lack of gender diversity wasn’t because of intentional decisions to exclude women

but that the fact that more women were needed in organizational positions just wasn’t on the minds of those in the “old roboticists’ network.” An anecdote from Lee supports this; he “personally did not pay much attention” to gender diversity until 2005 when he started working for the National Science Foundation (NSF). Being there and learning about the NSF’s diversity inclusion efforts made him stop, look, and see how few female colleagues were participating in the same top-level groups. Amato further speculated that more women likely would have accepted organization and leadership positions in that past but that they just weren’t being asked. Prior to the 2015 ICRA, when organizing teams for different conferences were asked, “Why did you not include more women in your team?,” the most frequent response was, “Well, we just don’t know any more women that have experience.”

The goals for the 2015 ICRA were set entirely by the all-women organizing team; Lee stepped out of the way after transferring the general chair position to Parker. The primary organizational goal was to address the perceived shortage of experienced women by training a large number of women in conference organizing roles and broadening the pool of women who could be tapped in the future. The second goal was to help build a network between women in

robotics for support and ideas since “in many cases, the women [in robotics] don’t know each other because we’re so few and far between and have not had a chance to work with each other.” The final goal was simply to raise awareness and visibility of the many great women in robotics and give them a chance to propel their careers through leadership. Parker noted that “if somehow the conference had flopped, it might not have achieved its purpose. But because the conference was so overwhelmingly successful, it helped give a

lot of credence to the fact that women can organize events just as well as men.” In addition to the organizing board, she and Amato made sure to have strong representation of women in speaking roles, with half the keynote speaker positions and two-thirds of the plenary speaker positions awarded to women.

Amato remembered that “it ended up that we basically were a team, we pretty much did everything together. We did not have the traditional general

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Parker delivers opening remarks.



Ruzena Bajcsy honorary chair, delivers remarks.

chair/program chair breakdown of tasks.” They also didn’t experience nearly as much pushback as they were expecting and said that “overwhelmingly, the support [from the community] was extremely strong.” Otherwise, many of the challenges they faced were simply inherent to the scale of the task.

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ference that happened to be organized by women. The only unexpected thing they both mentioned was a surge of registrations close to the conference date that they had to scramble to accommodate. On the bright side, that led to record attendance at the conference.

They emphasized that “it was a massive conference and a massive amount of work.” They talked with many community members who previously organized conferences and were told things to be aware of, so they considered themselves fairly well prepared. It was just another con-

Despite the success, Amato described the years immediately afterward in regard to gender diversity as “extremely depressing.” Many conference organizing teams for the following years were “pretty bad in terms of female representation.” Parker had a similar description for the two years prior to the 2015 ICRA, stating that “when we were pushing very much for other conferences to have more women, it did not feel like we were having much of an impact.” Lee was chair of the steering committee for IROS from 2009 to 2019, and after 2015, he did try to push IROS to include more women in leadership positions. It was difficult to get female general chairs, but he encouraged the male general chairs to get more female colleagues involved as cogeneral chairs, coprogram chairs, committee members, and plenary and keynote speakers.

All three agreed that the five-year lead time on conferences was a big reason for the lack of gender diversity in general chair positions. They also agreed that the fact that committees are usually put together three years in advance is likely the reason that inclusion efforts for the conferences immediately before and after the 2015 ICRA sometimes felt like “talking to a brick

wall. It’s not that people won’t tell you what they think you want to hear, but behavior is another thing. Getting people to follow through and actually include women in these conferences is another thing.” The number of women in conference leadership has increased 43% since 2015, so “it simply took a little time for the later conferences to catch up.”

The three interviewees had a plethora of ideas when asked how they think gender diversity in conference organization and leadership could be improved. One suggestion was to limit the selection of people for certain roles based on how many years they’ve held a position. This would help avoid reusing the same group of people over and over again. It would also lessen the reliance on more senior community members and bring in more junior people from more diverse generations. Another idea was to establish a directory or roster of people interested in conference organization and who had arranged conferences, along with the positions they held. It was described as “a volunteer directory of people who have done things and would like to do more things that help organizers find community members they don’t know so they can get more people involved.”



Amato delivers opening remarks.



Daniela Rus, plenary speaker and chair of the Organizing Committee, delivers remarks with Bacsy.

The last suggestion was for conference overseers to make some sort of recommendation that a certain percentage of the organizing team be brand new to a conference, perhaps 10–20%. It would be “a model where you first help organize some symposia or workshops then work up from there to organize in some larger conferences and finally the massive conferences,” and it would help bring in “new blood” for both women and men. However, there was some disagreement with this quota system, and the idea of extensive statistics reporting for conference organizers was also brought up. The rationale for the statistics was that understanding opportunities organizers are offering will make organizers think about ways they can “make measurable improvement” in diversity without top-down recommendations, such as by simply increasing the number of positions and awards available. “By just having more opportunities, they don’t have to leave

out the people they wanted to include, but they can think about adding more.”

The interviewees admitted that seeing the impact of their efforts from 2015 and before is “really gratifying.” However, the work to improve the representation of women in robotics is ongoing. An eventual goal of one interviewee is to be gender-blind in conference organization. This can be accomplished by building a community where everybody is equally engaged, leading to natural diversity. “Then we wouldn’t need to be quite so intentional about who does what.” The RAS Conference Advisory board is doing its part by tracking the gender diversity of proposed and completed conferences, in both leadership positions and in keynote speaking roles. This, and other efforts promoted by WIE within the RAS, should help continue to encourage gender diversity.

Since ICRA is the largest robotics conference, the differences from the

norm in 2015 were more visible. The conference acted as a kick starter to change, putting the problem in the minds of thousands of community members and getting them thinking about how to continue making positive differences. The revolutionary idea and excellent execution of the 2015 women-led ICRA propelled robotics to a point where we can freely have these conversations with our colleagues and continue to make meaningful change.

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