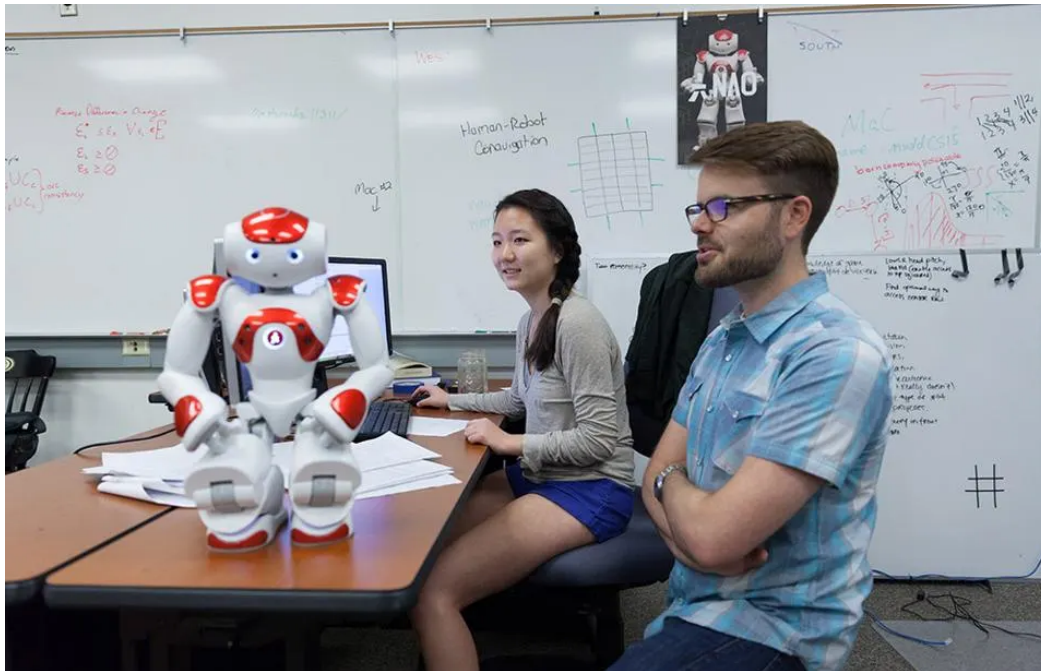# Why Diversity In AI Is So Important

Maria Klawe Former Contributor ⓘ

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Harvey Mudd computer science professor Jim Boerkoel works with a student in his robotics lab, where ... [+]   HARVEY MUDD COLLEGE

The rapid expansion of artificial intelligence from facial recognition and self-driving cars to understanding human speech is having a major impact on business and society, which is why the lack of diversity among the people developing AI tools is so troubling.

A recent study published by the AI Now Institute of New York University concluded that a "diversity disaster" has resulted in flawed AI systems that perpetuate gender and racial biases. The report found that more than 80 percent of AI professors are men and only 15% of AI researchers at Facebook and 10 percent of AI researchers at Google are women. The numbers reflect a larger issue facing the computer sciences where, in 2018, less than 25 percent of PhDs were awarded to females and/or minorities, who are historically underrepresented in computing.

Industry and academia are taking steps to increase diversity among AI researchers through steps designed to ensure that future technology benefits all people and not just a homogenous group of white males.

Jim Boerkoel, a computer science professor at Harvey Mudd College in Claremont, Calif., recently received a two-year grant from the National Science Foundation to address the challenge of building a healthy cohort of AI researchers that represents the broader society. His project, "A Consortium for Cultivating Future Artificial Intelligence Researchers," added a [one-day consortium and full travel scholarships for undergraduates](#) attending the annual Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence in 2020 and 2021. The consortium provides mentorship and cohort development to integrate undergraduates into the AI research community, and was originally envisioned as part of his 2017 NSF CAREER award. The consortium is also supported by AAAI and the Artificial Intelligence Journal (AIJ).

Boerkoel co-chaired the first consortium with Memo Ergezer, assistant professor of computer science at the Wentworth Institute of Technology in Boston, MA. Boerkoel leads Harvey

Mudd's [Human Experience and Agent Teamwork Lab (HEATlab)](#) designed to develop techniques that augment humans' cognitive and physical abilities to create integrated human-robot teams that are more effective than their individual counterparts.

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Sloan Davis, Program Manager, University Relations at Google, is a member of a team within Google Research that is focused on supporting diverse, equitable and inclusive computing research communities through outreach. The team manages programs and partnerships that involve students early in the culture of research, provide support from mentors, and highlight research careers.

Recently, I talked with Boerkoel, Davis, Brihi Joshi, a senior from Indraprastha Institute of Information Technology, Delhi, and Pazia Bermudez-Silverman, a senior at Brown University studying Computer Science and Africana Studies, all of whom attended the first AAAI Undergraduate Consortium.

Maria Klawe: Why is diversity so crucial to the development of Artificial Intelligence?

Jim Boerkoel: One of the challenges is that when there's a lack of diversity, there's a lack of diverse thought. If the population that is creating the technology is homogeneous, we're going to get technology that is designed by and works well for that specific

population. Even if they have good intentions of serving everyone, their innate biases drive them to design toward what they are most familiar with. As we write algorithms, our biases inherently show up in the decisions we make about how to design the algorithm or what and how data sets are used, and then these biases can get reified in the technology that we produce. A lot of AI tools are driven by data, and data comes from society, which has its own built-in biases. For example, when trying to design a tool that tries to learn whether someone is credit worthy using historical data, the historical biases in the process that exist are going to be copied and learned by the machine.

It's incredibly important to have a diverse set of people in the room, but we also need people who can ask questions like, "Here is what I see in the data. What problematic things can come up because of that?" It's a hard problem to solve. You can take the race column out of the data to try and render the algorithm race blind, but algorithms can quickly relearn these biases through proxies and correlates for things like race or gender in the data. If the data we're feeding in is already biased and we don't put safeguards in place to protect against bias, we can con ourselves into believe the algorithm is really fairly and agnostically making decisions. This is a recipe for trouble. We'd be better served to have more diverse people tackling those problems to mitigate the chances that our own privileges and context blind us to the experiences of others.

Maria Klawe: Can you give us a brief description of the project?

Jim Boerkoel: The consortium was a one-day event on the first day of the 2020 Association for the Advancement of Artificial Intelligence (AAAI) conference in New York. It was designed to

help undergrads determine if grad school is a good fit for them and hopefully convince them that it is. In addition to featured speakers and panels, a key part of the event was the mentoring program where undergraduates were paired up with known researchers in the field for one-on-one experiences in which mentors gave them feedback on their work and offered advice on how to apply to grad school and find an advisor. In addition to the research mentors, the undergrads were paired with grad students to give them another point of contact and someone they could reach out to with questions that they might not feel comfortable asking a professor.

Maria Klawe: Why did you decide to take this approach to trying to increase diversity among AI researchers?

Jim Boerkoel: We are seeing more and more undergraduate students attending academic conferences, and the experience can be daunting given the number of big names in the field who attend and the fact that the students have to present their own research. While grad students have a cohort and there are programs specifically for them, there wasn't a lot of onboarding support for undergrads at these conferences. There was a gap in what was offered and whom these opportunities were being offered to.

This program tries to attract a diverse set of undergraduate students who are interested in AI research and help them see themselves as belonging in the field of AI and pursuing AI research. We are seeing more and more of our students, particularly our underrepresented students, going into different fields or into industry. We are trying to capture more of them into PhDs and convince them that getting a PhD can give you more influence and impact in their fields.

Maria Klawe: What were the most important aspects of the Undergraduate Consortium?

Jim Boerkoel: The two most important pieces of it in my view were the mentoring and cohort building. A number of speakers and panelists drove home the point that their professional networks are full of people whom they met as student peers at their first academic conferences and who are now CEOs of companies and of AI divisions, presidents of universities, people from all over academia and industry. They really highlighted how much value there is in having a peer cohort that you can get to know, can see from year to year at these conferences, and check in with. These people become your network. Having a core group of peers and mentors whom you identify with makes academia less intimidating. Hopefully the program was also excellent and they got a lot of good out of it, but I believe the most intangible benefits came from the mentoring and peer mentoring.

Maria Klawe: Brihi and Pazia, as participants, what was your overall impression of the conference and the undergraduate consortium specifically?

Brihi Joshi: The consortium exceeded my expectations at all levels. The friends that I made there are people I am still in touch with, post-conference. Their experience and work made me understand the diverse backgrounds people come from. The mentorship program was amazing. My mentor was extremely frank with me (something that I needed, since I would soon be applying for grad school) with all the questions that I jammed her with about research, PhD life, academia, etc. I clearly remember Jim telling us in the session that 'we belong,' and the UC made it happen.

Pazia Bermudez-Silverman: AAAI was my first academic conference ever, and it definitely struck me as pretty technical. It was really great that there were people from all over the world who seemed to be familiar with and interested in each other's work, and the collaboration that suggests really appealed to me. I think this being my first academic conference, especially as an undergrad, being a part of the UC was so important. Feeling like my work and my presence at the conference mattered, meeting others my age also working in AI and having programs specifically for us was really valuable to me.

Maria Klawe: What was your favorite part of the Undergraduate Consortium and why?

Brihi Joshi: My favorite part about the UC was the AMA panel session by the professors from various institutes. Their experiences were everything at once — entertaining to hear, informative, realistic and super helpful. I am a person who dislikes taking notes (even in classes), but I ended up filling close to 10 pages writing down everything that I could because I thought it would be helpful for my grad applications soon. The entire panel cohort was reputed and doing amazing research, and I probably wouldn't have had the guts to email them if I wanted to earlier, but UC gave me a platform to speak to them and even ask my own questions about grad school.

Pazia Bermudez-Silverman: My favorite part of the UC was my relationship with my mentor (and meeting others' mentors, who were also doing amazing work) as well as meeting other people in the cohort. I think my most important takeaway from the UC was that I might have a future pursuing graduate education in AI/computer science and the importance of that experience in general.

Maria Klawe: Sloan, why did you connect with the UC at AAAI?

Sloan Davis: I attended AAAI 2020 with a group of 11 students. The Undergraduate Consortium stood out as a forum explicitly intended to allow undergraduates to build connections with their peers, learn about pathways to a PhD from faculty and graduate students alike, and gain further context about what research in artificial intelligence looks like.

Maria Klawe: What were your general takeaways and impressions of the UC?

Sloan Davis: "You belong!" was a theme repeated explicitly and implicitly throughout the day, and it was clear from the students' questions and conversations that they really wanted to know what the experience of being a computing researcher was like and how to get there. We know that mentorship, building community and belonging, hands-on research experiences, and attending technical conferences make students, especially those from underrepresented groups, more likely to stay in their computing major and pursue graduate studies—the UC checked all the boxes. It was energizing to see a constellation of professionals supporting the future of CS research by showing up for future researchers.

The second AAAI-UC will be held virtually in conjunction with the AAAI-21 conference, which will take place Feb. 2-9, 2021. The deadline for applying is Monday, Sept. 28, 2020. Instructions for applying to the Undergraduate Consortium can be found on the AAAI-UC website. The AAAI-UC welcomes applications from all undergraduate students exploring a career in AI research, especially students who identify with groups that

computing has traditionally underserved and also students who have limited resources related to graduate school at their home institutions.

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I am the president of Harvey Mudd College, the best place for undergraduate science and engineering education on the face of the earth. My passion is to improve and... **Read More**

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