

# Crystallizing Girl Power on the Road to Success

**Team 1469A**

**It Is What It Is**

Nadia Wilson, Lauren Roberts, Steven Tu, Oeden Garcia

Northridge, CA

# Might As Well Have A Cape!

When I think of Girl Powered, the first thing that comes to mind is that of the “long and hard road” I had to take to be recognized for the things that I did. For long the robotics world has been a “male dominated” field where even if girls are allowed to participate, their contributions are not easily seen and recognized.

It took many years for me, as the only girl in the robotics team, to be held equally to the other members on my team, and to be given the same opportunities as them. So many times my ideas were pushed off to the side and disregarded solely based on our gender. It took energy, and sheer perseverance to overcome those obstacles and grow. That inspired me to help empower other girls to express themselves, and be heard!





# Our team is like a crystal that grew from seeds planted years ago and paths that crossed.

- When I, Nadia, first joined robotics, the team had 2 girls and 2 boys, one of which was Oeden. We were just learning about VEXIQ Robotics. We learned together and we all thrived. I worked on the design, the build of the robot, basic programming, and I learned to document our steps in the notebook. We were so excited when we got the Design Award, even though our robot did not do as well in competition as we wanted.
- The next year, there were a few girls that started on the team, but also many more boys. Girls started by driving and building, but soon, many gave up after the research project was completed. I remained the only girl in a team of boys. That was really tough since I never felt I was taken seriously, because I was a girl. The boys would hardly let me drive and my suggestions were ignored. I had to get down to business and prove myself as the team advanced to State and then to Worlds. Nobody could take this away from me, I thought. I felt empowered! I developed a lot of confidence while competing at Worlds and it really showed. When our team won the Inspire Award, I was incredibly proud that I had persevered despite all the obstacles, and found success.
- The next year, I was the captain of my Middle School VexIQ team. Again, I was the only girl on the team. I worked on robot design and build, drove the robot in practice and competitions, and worked on the research project while documenting in the notebook. We were really proud to win Design award!
- The 3<sup>rd</sup> year of VexIQ I joined Oeden again, on a team of 2 girls and 4 boys. We maximized each other's strengths and we were successful. My confidence had grown exponentially and I truly felt heard as a member of the team. This time, I focused on the programming and interview techniques. We won many awards along the way, including Innovate Award at Worlds!
- That year I felt confident enough to captain a VRC team of middle school girls as well. We won Excellence award!

# Lauren - Our Team Captain

I met Lauren when I was in 4<sup>th</sup> grade and I was struggling with my VEXIQ robot. She was a successful 6<sup>th</sup> grader roboteer. She showed me various mechanisms and builds and taught me which ones perform better. She also taught me about strategy for success in competition. I was impressed and wanted to be just like her!

Lauren continued to be successful in VRC robotics, winning many awards including Design and Amaze Award at World Championships.

Lauren organized Girl Powered Workshops, and encouraged many other girls to participate. Following her example, I organized Girl Powered events at my former elementary school as well.

Lauren now helps set up VRC tournaments and volunteers as referee, in addition to being captain of our team.



# Team - It Is What It Is

This year, Lauren and I teamed with Oeden and Steven to be on Team 1469A, "It Is What It Is". Oeden is still in Middle School, but his passion for robotics got him on this High School team.

Lauren's technical expertise is still the centralizing force in our team. She is the main builder, taking into consideration all of our ideas to create and improve the robot design. She programs the robot and also updates the Engineering Design Notebook, while we contribute competition writeups and brainstorming.

Steven drives the robot in the competitions, while Oeden is master at Skills.

I, Nadia, help them out in all of their tasks and assist with game strategy.

Throughout the years that each of us have been involved with robotics, we tried a diverse range of "roles" on our separate teams. This allowed us to figure out which roles best suit us, to get the most out of our robotics experiences. This year is the culmination of all we learned. All four of us are able to contribute to every aspect of the robot. That allows us a higher level of self-confidence and efficiency, as we continuously improve our game.

We also made friends in many other teams and their competition enriches us. We help each other improve and advance, to ultimately achieve the best robotics experience.



Nadia, Lauren, Steven and Oeden



# Jeanette Bohg, PhD

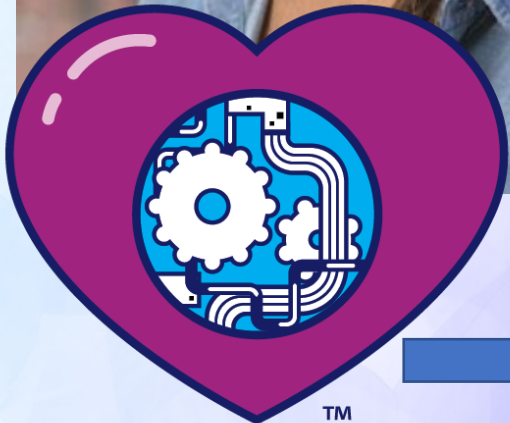
We are inspired by Dr. Jeanette Bohg, Assistant Professor of Computer Science and Professor of Robotics at Stanford University.

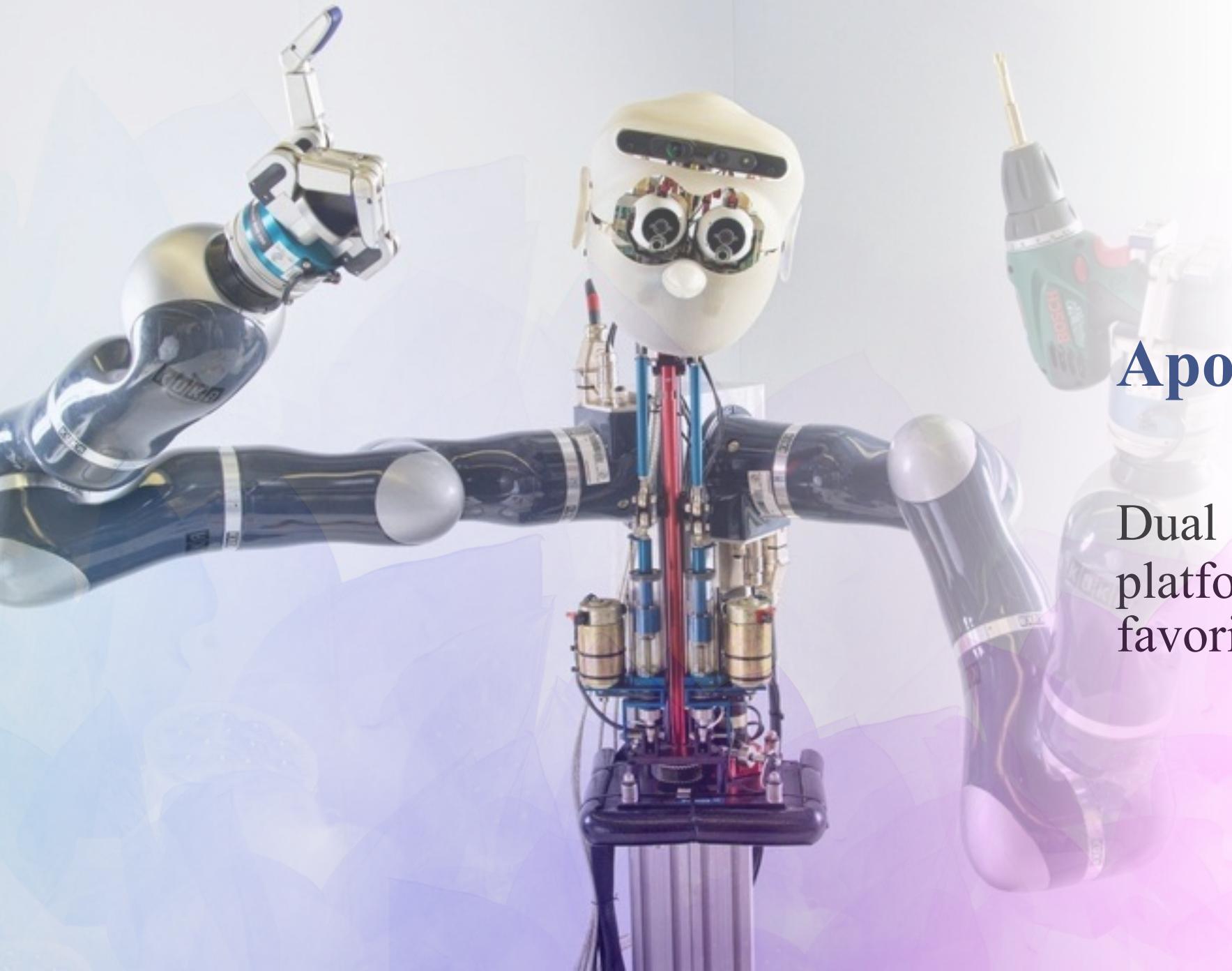
Prior to joining the faculty at Stanford, in the Human Artificial Intelligence Lab, she was a group leader for the Autonomous Motion Lab at the Max Planck Institute for Intelligent Systems. Her research focuses on identifying the principles of sensorimotor coordination in humans and trying to implement those principles in a robot to achieve robotic grasping and manipulation.

We listened to her talk, **Vision, Touch & Sound for Robustness & Generalizability in Robotic Manipulation**, describing her research project. She appears young, determined, full of confidence. She is shown with her group of students, with gender and apparent ethnic diversity, all comfortably dressed. They appear approachable and confident.

She is very well spoken as she describes her big goal of designing a robot that can use touch and other senses to manipulate objects, just like a human. She shows realistic plans of achieving that goal. She starts the talk by saying that humans are incredible machines, and describes her project with a child learning a Junga game, as prototype for a robot using sensory cues to improve grasp. That made her so relatable for us budding robotees!

Her accomplishments are also remarkable. She is the 2019 recipient of the IEEE International Conference on Robotics and Automation (ICRA) Best Paper Award, the 2019 IEEE Robotics and Automation Society Early Career Award and the 2017 IEEE Robotics and Automation Letters (RA-L) Best Paper Award.





**Apollo:**

Dual arm manipulation  
platform and Dr. Bogh's  
favorite robot



# Ultimate Lesson

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- My experience with robotics, the opportunity to navigate the inherent bias of gender inequality in robotics with successful results, gave me wings. Girl power felt magnificent!
- When all of our voices are included, and our collective creativity is channeled into a final product, we get better results.
- So, after all the struggles with nuts and bolts, gears, heating motors, and coding language, learning to speak to be heard was the best life lesson.



# Resources

<https://hai.stanford.edu/people/jeannette-bohg-0>

[Jeannette Bohg | Autonomous Motion - Max Planck Institute for Intelligent Systems \(mpg.de\)](#)

[Breaking the Glass Ceiling Early On: How to Empower Girls in STEM | Georgia Tech Boot Camps \(gatech.edu\)](#)

[More Women Are Needed In Robotics Technician Roles | Built In](#) : by Cassie Moreira

Sex, Race and Robots: How to Be Human in the Age of AI. Audiobook by [Dr. Ayanna Howard](#) and Narrated by: [Amandla Stenberg](#)