

IEEE ICRA 2015—Celebrating the Diversity of Robots and Roboticians

The IEEE International Conference on Robotics and Automation (ICRA) was held at the Washington State Convention Center in Seattle, Washington, 26–30 May 2015. ICRA is the flagship conference of the IEEE Robotics and Automation Society (RAS) and is a premier international forum for robotics researchers to present their latest work.

Over 3,000 attendees (an ICRA record) participated in a wide variety of activities. Highlighting the conference were 940 technical papers presented over three days in ten parallel tracks, representing authors from over 40 countries. These technical talks, presented as short highlight talks plus interactive presentations, were selected from 2,275 submissions (an ICRA record), by the Senior Program Committee (Figure 1), resulting in a 41% acceptance rate. Workshops and tutorials were also extremely popular, with over 1,400 attendees (an ICRA record) participating in 42 workshops and tutorials.

Excellent plenary talks were given by Daniela Rus (Massachusetts Institute of Technology), Helen Greiner (CyPhy Works), and Dean Kamen (DEKA Research and Development Corporation) and were streamed live during the conference. Twelve keynote speakers also highlighted their latest research. All of the plenary and keynote talks are available on the ICRA 2015 website (www.icra2015.org) and on YouTube.

IEEE ICRA 2015 included a vibrant industrial exhibition, with over 65 exhibitors (Figure 2) from industry and academia, along with publishers and technical societies. The opening night reception in the exhibit hall recognized the exhibitors and sponsors who supported the conference.

Many innovative forums and special events were held at ICRA 2015. A new forum was created this year to highlight

robotics activities and education in the developing world. This forum included presentations on robotics in Mexico, Egypt, South Africa, Peru, Ghana, Thailand, and India. Also new this year was a special RAS conference highlights track, which featured top papers from four other RAS conferences: 1) IEEE Workshop on Advanced Robotics and its Social Impacts 2014, 2) IEEE International Conference on Automation



Figure 1. The IEEE ICRA 2015 Senior Program Committee. (Photo courtesy of IEEE ICRA 2015.)



Figure 2. The IEEE ICRA 2015 exhibition featured over 65 exhibitors. (Photo courtesy of IEEE ICRA 2015.)

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Figure 3. Peter Hart, Rodney Brooks, and Raja Chatila help celebrate the 50th anniversary of Shakey. (Photo courtesy of IEEE ICRA 2015.)



Figure 4. The Go, Girl, Go! event brought 600 middle and high school girls to the conference to network with established robotics researchers and professionals. (Photo courtesy of IEEE ICRA 2015.)

Science and Engineering (CASE) 2014, 3) IEEE Haptics Symposium 2014, and 4) Humanoids 2014. For the first time, ICRA also held a late-breaking results poster session, which highlighted the research of over 100 participants. A special celebration of Shakey's 50th anniversary was held (Figure 3), in conjunction with the Association for the Advancement of Artificial Intelligence (AI) to promote interactions between the AI and robotics communities.

Continuing the tradition of recent ICRAs, this year's conference also held industry and government forums and RAS Town Hall. The industry forum focused on strengthening ties between academia and research, building networks, and fostering entrepreneurship. The government funding panel discussed robotics funding and policy issues in the Americas, Europe, and Asia. The town hall was led by RAS President Raja Chatila and Antonio Bicchi, the editor in chief of *IEEE Robotics and Automation Letters (RA-L)*, who discussed this new journal and its connection with ICRA. Papers published in *RA-L* will have the option of being presented at future ICRAs.

Special attention was paid to students at this year's ICRA, with innovative programming targeted to them. More than 150 students received travel scholarships sponsored by RAS, the National Science Foundation (NSF), and ICRA. A newly introduced Ph.D. forum was held to provide mentoring for graduate students. Becoming a Robot Guru, a special program for college students, was also held during ICRA. For the first time, a career fair was held to help connect recent graduates to companies that are hiring robotics specialists. For younger female students, an innovative Go, Girl, Go! event was organized by the conference, together with the Washington State For Inspiration and Recognition of Science and Technology (FIRST) Robotics organization, which brought together over 600 middle and high school girls to learn about career paths

in robotics (Figure 4). RAS also sponsored several lunches for women in robotics, graduate students, and recent graduates. Students were also strong participants in the five robot challenges held this year. The Amazon Picking Challenge (Figure 5) was a popular robot challenge.

An awards luncheon was held to recognize the highest quality technical papers, RAS awards, Best Editor and Reviewers of the Conference Editorial Board (CEB), and the Robot Challenges Awards. A full listing of the award winners is given at icra2015.org/conference/awards. At the luncheon, special recognition was given to the Honorary General Chair Ruzena Bajcsy, who celebrated her birthday that day (Figure 6).

Time to socialize with colleagues and potential collaborators is also vital to a good conference, and ICRA 2015 provided plenty of opportunities. Along with the opening reception, a reception held at the Experience Music Project Museum for Music, Sci-Fi, and Pop Culture provided a unique experience for attendees to create their own music and experience contemporary pop culture. The closing reception at the Boeing Museum of Flight (Figure 7) gave attendees excellent views of one of the largest collections of air and space technology in the United States.

As shown in the ICRA 2015 graphic (Figure 8), the unofficial theme of the conference was celebrating the diversity of robotics and roboticists. The conference embraced this theme by including



Figure 5. A robot challenge at the IEEE ICRA 2015. (Photo courtesy of IEEE ICRA 2015.)



Figure 6. Honorary General Chair Ruzena Bajcsy celebrated her birthday during awards luncheon at the IEEE ICRA 2015. (Photo courtesy of IEEE ICRA 2015.)



Figure 7. The IEEE ICRA 2015 closing reception at the Boeing Museum of Flight. (Photo courtesy of IEEE ICRA 2015.)

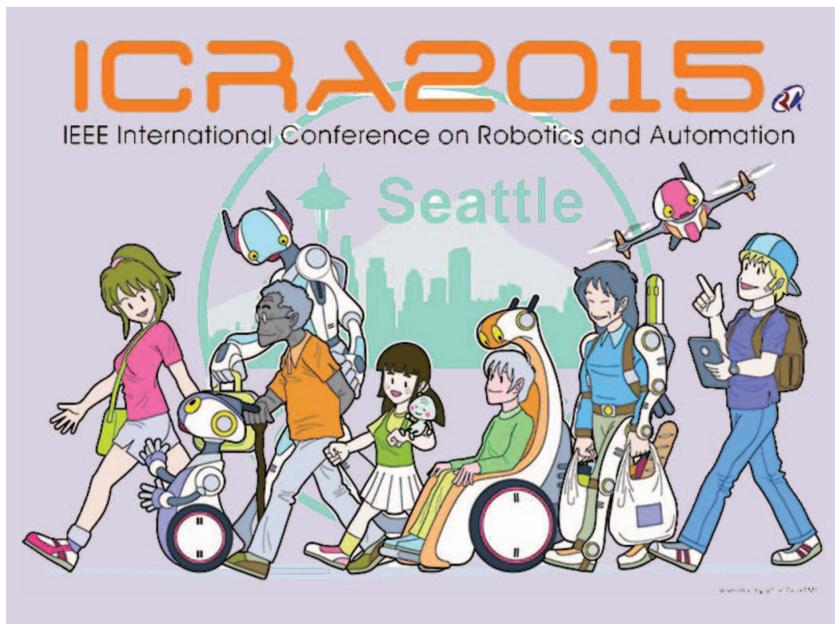


Figure 8. The IEEE ICRA 2015 graphic that was displayed on the Seattle Monorail that transported conference attendees to and from the EMP for the conference banquet reception. (Photo courtesy of IEEE ICRA 2015.)



Figure 9. On the way to Tillicum Village for the VIP dinner, to acknowledge the service of the ICRA Organizing Committee and the CEB. (Photo courtesy of IEEE ICRA 2015.)



Figure 10. Allison Okamura, Lynne Parker, and Nancy Amato thanking the ICRA Organizing Committee and the CEB at the VIP dinner at Tillicum Village. (Photo courtesy of IEEE ICRA 2015.)

programming to encourage and support groups underrepresented in science, technology, engineering, and mathematics fields to consider careers in robotics. These included featuring an all female organizing committee (see poster available on ICRA 2015 website, www.icra2015.org), and hosting the CRA-W/CDC and NSF-sponsored Robot Guru workshop and the Go, Girl, Go! event that was coorganized by Washington FIRST Robotics.

Putting together ICRA 2015 required a tremendous amount of volunteer effort. The VIP dinner at Tillicum Village (Figure 9) was a special way to thank the Organizing Committee and the CEB for their hard work putting together the conference. Special thanks goes to Allison Okamura (Figure 10), who served as the editor in chief of the ICRA CEB and the entire CEB, who handled over 6,200 reviews of the submitted papers. We are also very grateful to all of the hard work of the outstanding Organizing Committee and the student volunteers, the strong support of the RAS, the generous sponsors, the speakers, and the attendees, for making ICRA 2015 a great success! To find out more about ICRA 2015, please visit www.icra2015.org for complete details and photos of the events.

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