will be open to discuss further issues with the appropriate bodies and organizations to derive actions that need to be taken. The committee will also serve as an advisory body to local, national, and international groups and governments.

The recent evolution of a wide variety of robotics and component technologies is rapidly enhancing their capabilities. For example, unmanned aerial vehicles quickly surveyed wide disaster areas, remotely operated underwater vehicles to repair leakage of subsea oil plants, while unmanned ground vehicles worked in contaminated areas of damaged nuclear power plants. Twenty years ago, unmanned aerial vehicles could only gather information from sky. At present, unmanned aerial vehicles can approach structures of interest in the neighborhoods to provide detailed visual inspections for maintenance. They can also enter damaged buildings through narrow entrances to search for victims. The autonomy and intelligence of unmanned ground vehicles can reduce responders' loads and integrate gathered information with measured three-dimensional information into GIS. For this reason, specialists predict that robotics will become an essential tool for preparedness, response, and recovery in ten years. The implementation of robotics with information and communications technology is needed to support the Post- 2015 Framework of Action by enriching the global risk awareness with local information in detail.

The contribution of robotics is mainly: 1) to gather information and perform tasks that humans and conventional equipment cannot (e.g., search and rescue in inaccessible places and the inspection in highly contaminated areas), 2) to reduce risks (e.g., substitute workers to avoid potential damage from explosions, toxic agents, and radiation), and 3) to reduce time and cost (e.g., quick surveillance of potentially damaged facilities and high places without scaffolds).

Records of robot applications to disasters from the last decade show gaps that have be filled to fully utilize of robotic solutions. The following issues must also be discussed and solved.

Technologies need more improvement and development for required tasks at disaster sites with higher technology readiness levels. Particularly, performance of mobility, stationary, sensing, recognition, remote situation awareness, wired and wireless communication, human interface, intelligent autonomy, task execution performance, and compliance under/with disaster conditions and environments including explosions have to be sufficient in the systems using robots, humans, and organizations. The international collaboration of academic societies, research centers, universities, test facilities, robot solution contests, and robot training curriculums have to be promoted to make them ready.

Second, social barriers to deployment and application of robots have to be lowered. Regulations and systems have to be adjusted for this new innovation, particularly for disaster countermeasures, road traffic, maintenance of infrastructure and industrial facilities, performance test methods for procurement, and insurance for predicted risks with Good Samaritan laws. Safety standards, wireless frequency allocation, and component interfaces have to be common and standardized internationally for the exchangeability and reusability of systems to foster smooth international cooperation in megascale disasters.

The united efforts of all the relevant stakeholders in the newly established international committee will resolve the technical and social issues to fill gaps for the full use of this new technology in the future.

# Innovations in Robotics Panel at the 2015 WIE International Leadership Conference

By Laura Margheri

The IEEE Women in Engineering (WIE) International Leadership Conference (WIE-ILC) is the flagship and largest event organized by the IEEE WIE. On 23–25 April 2015, the second WIE-ILC took place in Silicon Valley, San Jose, California, with the theme "Lead Beyond. Accelerating Innovative Women Who Change The World." The focus of the conference was on leadership, innovation, and entrepreneurship, with four tracks:

1) innovation (skills to create a new technology, lead innovative teams, foster creative cultures, or develop disruptive technology)
2) empowerment (skills to help women advance in their careers)
3) entrepreneurship (skills around start-ups, business models, venture funding, finance, or leadership communication)
4) executive leadership (skills for team leadership, career management, and advancement).

More than 700 attendees joined the event, with an exciting program, including nine

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keynote speakers, 36 parallel sessions and 13 virtual sessions in three days.

The IEEE Robotics and Automation Society (RAS) was one of the sponsors of the event, and representatives of the RAS WIE Committee were among the speakers. A panel session on leading innovation in robotics and automation was proposed and accepted for the innovation track. The conference board received an incredible number of proposals this year, and they were able to accommodate only 18% of the submissions.

Jing Xiao (professor, University of North Carolina), Lynne Parker (director, National Science Foundation), and Allison Okamura (professor, Stanford University) were the three speakers in the panel and talked about their experience, technical and scientific skills, and other aspects related to the personality traits that can make the difference in innovation and leadership in robotics a roundtable moderated by Laura Margheri (RAS WIE chair, The BioRobotics Institute, Scuola Superiore Sant'Anna). RAS activities and opportunities were also presented (Figure 1). The room was full of researchers and managers, and there was a lot of interaction with the speakers after the end of the session.

**A panel session on leading innovation in robotics and automation was proposed and accepted for the innovation track.**

The panel was an inspiring and motivating showcase of leadership of women in robotics and automation. Furthermore, the panel at the 2015 WIE-ILC conference was a great opportunity to increase the visibility of RAS within WIE and to involve both experienced women as well as young girls attending the event.

**Figure 1.** From left: Allison Okamura (professor, stanford University), Jing Xiao (professor, University of North Carolina), Lynne Parker (Director, National Science Foundation), and Laura Margheri (RAS WIE chair, The BioRobotics Institute, Scuola Superiore Sant'Anna).

**Figure 2.** Jessica Hodgins (Disney Research and Carnegie Mellon University).

**Figure 3.** IEEE WIE chair. Takako Hashimoto.

## IEEE ICRA 2015—Women in Engineering Lunch

The RAS WIE Lunch is the event that the WIE Committee organizes periodically at the International Conference on Robotics and Automation (ICRA), IROS, and CASE. The WIE Lunch is an important opportunity to foster discussion and collaboration, to inspire girls, and to advance female leadership in engineering and robotics. Each WIE Lunch includes a talk by an invited speaker.

During the ICRA in Seattle Washington, the WIE Lunch was sponsored by Disney Research, and Jessica Hodgins (Disney Research and Carnegie Mellon University) and Takako Hashimoto (the IEEE WIE chair) were guest speakers (Figures 2 and 3). The event had a record of 100 attendees.The WIE Committee would like to thank the great speakers and sponsers, as well as everyone who joined and actively participated in the roundtable discussion.