

# Women in Robotics and Automation

By Raja Chatila

It is common knowledge that women are underrepresented in science and engineering in general, and this is true worldwide. What is the situation in the IEEE and in the IEEE Robotics and Automation Society (RAS) in particular? The latest statistics from the IEEE, dated December 2014, provide the following figures:

- The total number of IEEE Members is 426,488, while the total number of women in the IEEE is 31,960.
- The total number of RAS members is 12,694, and the total number of women RAS members is 835.
- The percentage of women in the IEEE is 7.5% and 6.6% in RAS.

The IEEE is a global Society, which means that these figures should reflect the global situation. However, the average percentages of women in science and engineering are in the 15–20% range for the general areas of physics and computer science in industrialized countries. The situation of women in science and engineering has been analyzed thoroughly by many researchers and institutions worldwide, and this column is not the appropriate place to discuss the issue. The questions on which I would like to focus in this column are as follows:

- What is specific to the IEEE and RAS that makes our figures so low?
- How can we remedy the situation?

It is possible that the answer to the first question is related to a higher avail-

ability of men to participate in events and conferences organized by the RAS that require travel, which, therefore, makes membership more useful to them. This might explain the low membership figure with respect to the percentage of women professionals. However, I am not sure there are actually statistics supporting this, and it is probably something we should investigate. But it is a fact that we have many more men than women attending our major conferences.

The second question is in our hands to address. RAS should take strong positive action to involve more women in our activities and leadership. We should make it easier for women to attend our events, and we should set an example through the involvement of women in our leadership. Some might argue that, given the percentage of women members, it is normal that the RAS leadership has an unbalanced gender representation. This is true, but it ignores the dynamics of the situation: the more that women are involved in the organization's leadership, the more women will be attracted to become members.

Within the IEEE, IEEE Women in Engineering (WIE) is the world's largest international professional organization dedicated to promoting women engineers and scientists. Within the RAS Member Activities Board with Vice President Jing Xiao, our WIE liaison is Laura Margheri. A WIE lunch is organized at our major conferences to "provide an opportunity for all female and male professionals who are interested in

discussing the subjects of women's engineering education, career path, career/family choices, and other topics." The WIE Committee in RAS is also reflecting on concrete actions to better involve women in our leadership.

In this respect, the 2015 IEEE International Conference on Robotics and Automation is teaching us a great lesson. With Honorary Chair Ruzena Baczy, General Chair Lynne Parker, and Program Chair Nancy Amato, all the other conference committee members are also women. This is a bold decision, unprecedented in any conference in the area of robotics and automation and very probably in other fields. This clearly proves that RAS counts many dynamic women leaders among its members.

Having women leaders in robotics and automation will certainly have a great impact on how engineering and science are considered by the public. But we still need to do much more to promote membership and leadership within the RAS.

Our discipline can be an instrument to improve gender equality in science and engineering. Because of the attractiveness of robotics and automation to students and the general public, we can exploit the opportunity of our conferences, which take place yearly in countries worldwide, to be proactive in organizing events targeted to attract young students from both genders. We must create a new dynamic.