Understanding the Societal Impact of Autonomous Technologies
By Raj Madhavan

Autonomous technologies have a bit of a Hollywood problem.

Movies and TV shows have made it quite easy to talk about autonomous technologies such as robots, self-driving cars and unmanned aerial vehicles (UAVs). Hollywood has turned the topic into a dependable conversation starter in schools, in boardrooms, at dinner parties, etc., and that's definitely a good, helpful thing for researchers in the space.

At the same time, what Hollywood also has done is skew expectations. People see *Terminator* and expect robots to be able to do all sorts of complex and interesting things—when the reality of the technology today is that it is really, really hard to make a robot walk up a flight of stairs, much less carry out more involved processes to do chores around the house for a human.

The gulf between the public's understanding, expectations and fears around autonomous technologies and reality in this space is vast. The confusion and concerns surrounding robots, self-driving cars, UAVs, etc. are substantial. In some circles, autonomous technologies are equated with job losses and all sorts of harmful, unintended consequences, but it is irrefutable that such systems have the potential to dramatically enhance quality of life around the globe. Actual developers of autonomous technologies have a responsibility to ground the public conversation in reality.

And that is a large part of the reason for the launch of the IEEE Future Directions Committee incubation project, "Autonomous Technologies and Their Societal Impact." By bringing together industry, academia and government via workshops and panel discussions around the world, our group is driving a multi-dimensional, comprehensive conversation rooted in the actual state of the art of autonomous technologies, as well as the potential benefits and concerns surrounding their ongoing innovation and proliferation.

Open, collaborative gatherings have been staged around the world to help ensure that the unique perspectives of different expertise and regions are represented in the conversation. Workshops took place 20 June 2016 in Ottawa, Canada and 2 September in Solna, Sweden, and a forum was scheduled on 13 October in Daejeon, Korea, to examine autonomous technologies in relation to the laws, regulations and issues found in North America, Europe and the Asia-Pacific region, respectively (but not exclusively).

Through the workshops, Autonomous Technologies and Their Societal Impact is working to help technologists and public policymakers identify gaps and barriers to technological progress and drive toward a mutually agreeable blueprint addressing concerns around privacy, security, safety and ethical issues. Findings will be presented in other forums of decision makers globally, and consideration will be given to the potential role of a standing IEEE Future Directions Committee initiative on Autonomous Technologies and

Their Societal Impact and such a group's opportunity to help drive technology for the benefit of humanity.

There are a number of ways for you to engage in the work of Autonomous Technologies and Their Societal Impact.

Over the course of the workshops, the group is developing a white paper documenting the state of the art with an emphasis on technology and public-policy issues voiced by the various stakeholders from around the world. The white paper is to be published toward the end of 2016 and made available at the IEEE Future Directions Committee's website. We encourage your input, and we also seek your assistance in expanding the conversation. There might be pockets of individuals—maybe in the arts, for example—who have a particular stake in the development of autonomous technologies, and we want to do everything we can to ensure that the perspectives of such groups, no matter how far-fetched and disjointed they may seem, are not overlooked.

The IEEE Future Directions Committee's Autonomous Technologies and Their Societal Impact incubation project welcomes your voice in the global conversation about driving innovation in the space to everyone's mutual benefit.

Dr. Raj Madhavan is Chair of the Autonomous Technologies and Their Societal Impact (ATSI) IEEE Future Directions Committee incubation project, founder and chief executive officer of Humanitarian Robotics Technologies, USA, and Distinguished Visiting Professor of Robotics at Amrita University, India. He can be contacted via email at <raj.madhavan@ieee.org>.