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Muthu B. J. Wijesundara
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Introduction

2014 saw the debut of a new emerging technologies conference dedicated to Sensors for Next Generation Robotics. We envisioned our conference as a meeting forum for engineers and scientists, from academia, industry, and national labs, focusing on emerging sensors and their applications for robotics. Since every robot is equipped with sensors, we hope to bring to the forefront unique challenges of sensor fabrication, integration, information processing, control, and usability for robotics.

Due to the proliferation of mass-produced, miniaturized sensors, it is now possible to envision massively distributed sensors being used to enhance perception, cognition, and control capabilities of next generation robots. In fact, applications where new, more intelligent robots are needed cut across all dimensional scales and industrial sectors. Examples include assisted living environments, search and rescue in disaster areas, neural surgery and prosthetics, nanomanufacturing, self-driving vehicles, human-friendly industrial assembly and smart material handling, and so on. One exciting next generation application is endowing humanoid robots with perception comparable with those of humans, including distributed touch through robotic skin, hearing, and vision, but also super-human perception, such as the ability to see in the dark. Using off-the-shelf sensors that have not been designed specifically for robotics is fraught with additional challenges that must be mitigated by consideration of power, weight, and interconnection to the robot early on in the design process.

This conference focuses on new sensors and sensor arrays for robotics and autonomous vehicles, new form factors, and packaging schemes to help integrate robots and sensors, new applications of robots enabled by increased perception capabilities, and challenges in sensor fusion, networking, and control brought about by massive amounts of sensor data available to the robot. Technical scientific papers related to robot sensors that push beyond the state-of-the-art in industry are solicited. New robotics applications reflecting the state of art in industry, including those with dual uses (military-defense and commercial-industrial) are also welcome.

In 2014, the conference had 14 submitted papers and 15 presentations organized in 4 sessions, including: 1) Haptics and Tactile Sensing, 2) Sensor Arrays and Interaction Control, 3) Remote Sensing and Sensor Networks, and 4) Sensor Fabrication and Evaluation. We envision that the number of papers and attendance at our conference will increase in future years, as robots become more ubiquitous in our daily lives. We look forward to your participation in 2015!

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