GREGORY DUDEK, Canada

Gregory Dudek (S'87-M'91) I work on senor-based robotics and intelligent systems for human-robot interaction, topics that I believe will define our future. I obtained a Ph.D. in Computer Science from the University of Toronto, and a B.Sc. in Physics and Computer Science from Queen's University. I am currently the Director of both the School of Computer Science at McGill University, and the NSERC Canadian Field Robotics Network, and James McGill Chair. I also co-founded the company called Independent Robotics Inc. In 2010 I was awarded the Fessenden Professorship in Science Innovation and was also awarded the Canadian Image Processing and Pattern Recognition Award for Research Excellence and also for Service to the Research Community. I run the McGill Mobile Robotics Laboratory at McGill and have authored over 200 refereed papers. I have served as a reviewer, advisor and referee for numerous professional bodies and several national research programs beyond those in Canada.

IEEE Activities:
SOCIETY: I am the current president of the Canadian branch of the Image Processing and Pattern Recognition Society, sponsor of the IEEE affiliated CRV conference, and the national representative organization of the International Association of Pattern Recognition (IAPR).
CONFERENCES:
North American program co-chair for IROS twice.
Program committee member for ICRA and IROS on numerous occasions.
Program committee member and area chair for CVPR on several occasions.
General chair of the conference Computer and Robot Vision in 2000, general chair of the umbrella conference group combining Computer and Robot Vision, Graphics Interface, Artificial Intelligence, and the Precarn national meeting.
Program committee member for several other IEEE conferences
OTHER: Program committee member and area chair for AAAI and IJCAI (pre-2005).

Qualifications:
1. As a former director of a multi-faculty research center, the McGill Research Center for Intelligent Machines, and the current director of a department (the McGill School of Computer Science) I have had extensive experience dealing with research mentoring, leadership and coordination of multiple diverse research programs.
2. As an active member of the research community with past involvement in many activities (especially the organization development and stewardship of conferences and journals), I have a good sense of the research community, its diverse composition, and the challenges and opportunities it faces.

Major Accomplishments:
I am the Scientific Director of the NSERC Canadian Field Robotics Network, and federally funded research network that spans Canada, and which is one of the largest funding mechanisms of its kind available to our community. This research network funds robotics research across the entire Canadian nation and includes collaborators in the USA, the United Kingdom and Mexico. Its mission is to enhance and develop field robotics as a discipline through direct research support and also industrial interaction. As part of its activities the network sponsors roughly 100 graduate students and helps send them to IEEE conferences such as ICRA and IROS.

As President of the Canadian branch of the Image Processing and Pattern Recognition Society, I have played a key role in creating a nationally organized venue where robotics research can gain exposure (the Conference on

Computer and Robot Vision (CRV)). This conference is held annually, organized in Canada, and is indexed by IEEE Xplore and has about 50% international participation. It plays a particularly important role in terms of student engagement and building student research collaborations.

I have acted as a distinguished speaker for the Robotics and Automation Society promoting the RAS and the IEEE to interested students and the general public. When the distinguished speakers were explicitly selected and enumerated, I was selected as one of them and have given talks in this context on an ongoing basis, as well as normal academic and research presentations.

As Director of the McGill School of Computer Science for the last 5 years (and Director of the McGill Research Center for Intelligent Machines before that) I am responsible for strategic planning, mentoring, academic programs, and faculty and student recruiting. In this capacity I regularly consider issues of how to advance research in several different IEEE-related disciplines, how to encourage public outreach, how to promote student and faculty engagement, etc. During my tenure, McGill has often been recognized as one of the top 50 research university universities world-wide (e.g. by 18th in 2012 by QS Quacquarelli Symonds and also U.S.News & World Report LP, 34th by the Times Higher Education Supplement) and the School of Computer Science has been ranked between 1st and 3rd in Canada (depending on which metrics are used). My role has been to encourage and nurture our academic unit to achieve these standings.

Position Statement: It is clear that robotics is finally truly reaching the climactic point at which it is having widespread impact across many areas of human endeavor, and the IEEE Strategic Plan is very much aligned with this viewpoint. In this context, there are many challenges facing the RAS and the IEEE. These include the traditional challenges of recruiting and nurturing students and promoting the activities of broader research community, but I believe there will also be new challenges for us in terms of global interaction and representation, industrial interaction in the facing of shifting commercial impact and public outreach and "messaging" that will develop as the field takes on a new stature.

I think it will be important to retain a very strong emphasis on long-term high-impact research even as the potential for commercial and industrial engagement grows and presents opportunities that we do not want, and cannot afford, to ignore. This balance between fruitful applications and long-term research is one our community has always faced, but I think it will require more attention and management as the opportunities grow on all sides. These same tensions and concerns are clearly reflected in the IEEE Strategic Plan where globalization and societal impact are both highlighted, but where I feel the promotion of long-term research impact might be even more emphatically emphasized.

It has been in the nature of most successful areas of science and engineering to grow and bifurcate into more specialized sub-disciplines over the last century. Robotics, more than almost any other area, entails the integration of disparate skills and technologies to build functioning robust systems that address exceptionally diverse problems. Thus, retaining linkages between areas is critical and so I hope to help resist the standard trend towards "silo-ing" (over-specialization) and enrich the interactions between the representatives from different aspects of our field. I have tried to reflect this sentiment in my own research and in my own lab, which encompasses algorithm design and analysis from computer science, computer vision, software engineering, design and aspects of traditional mechanical engineering.

Likewise, as our community has become more diverse in terms of academic sub-fields, geography, and research horizon I expect we will have to carefully manage these diverse poles to remain relevant and supportive to the breadth of our community, possibly through increasing the scope of activities supported by the RAS.