

Safety, Security, and Rescue Robotics

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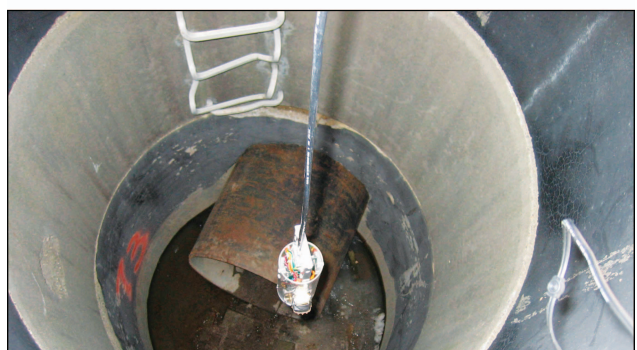
The Technical Committee (TC) on Safety, Security, and Rescue Robotics (SSRR) was organized in 2002 to help stimulate and coordinate research and development of robotics, automation, and intelligent devices and systems for civilian safety and rescue applications in the wake of natural and man-made disasters such as tornadoes, earthquakes, floods, fires, and explosions.

The SSRR TC has been extremely active this past year, as in previous years. Recent organized activities include the following:

- ◆ IEEE International Conference on Intelligent Robots and Systems (IROS) 2007 Workshop on Rescue Robotics, organized by TC Emeritus Chair Satoshi Tadokoro, Matsuno Fumitoshi, TC cochair, Hajime Asama, University of Tokyo (Japan), Koichi Osuka, Kobe University (Japan), and Masahiko Onosato, Hokkaido University (Japan).
- ◆ Special issue on SSRR for *Journal of Field Robotics (JFR)*, organized by Cochairs Richard Voyles and Howie Choset. According to Sanjiv Singh, *JFR* editor, this issue has three of the most downloaded articles in the history of the journal.
- ◆ The Fifth IEEE International Workshop on SSRR in Rome, Italy, 2007. Conference chair was Daniele Nardi, TC cochair. Program cochairs were Richard Voyles, TC cochair, Satoshi Tadokoro, TC emeritus chair, and Anibal Ollero, University of Seville (Spain).
- ◆ Planning for the Sixth IEEE International Workshop on SSRR in Sendai, Japan, 2008 is underway. Conference chair is Satoshi Tadokoro, TC emeritus chair. Discussion of the location for 2009 in the United States (likely Denver, Colorado) has been initiated.
- ◆ Rescue Robotics Exercise 2007 was held in Rome, Italy, to correspond with the International Workshop. This was organized by Daniele Nardi, TC cochair, and was held at the Istituto Superiore Antincendi (Italian National Firefighter Training Center). This exercise brought together robotics researchers, corporate developers, and emergency responders to demonstrate, operate, and critique robotic equipment and novel operator interfaces intended for safety, security, and rescue robotics applications. Approximately 50 researchers and 50 emergency responders attended.
- ◆ Rescue Robotics Camp 2007 was also held and organized by Daniele Nardi, TC cochair. This camp, intended

for robotics students and researchers, schooled participants on the needs and challenges of rescue robots and the current state of the art of rescue technology. Approximately 50 young scientists and engineers attended this important event for keeping the pipeline of researchers full.

- ◆ Special issue of *JFR* on “Quantitative Performance Evaluation of Robotic and Intelligent Systems” was organized by Raj Madhavan, National Institute of Standards and Technology (NIST) (USA).



- ◆ Organized Session “Safety, Security, and Rescue Robot Systems” at the International Conference on Instrumentation, Control, and Information Technology (SICE2008 in Tokyo) technically cosponsored by IEEE/RAS. Coorganizers were Matsuno Fumitoshi, TC cochair, Daniele Nardi, TC cochair, and Richard Voyles, TC cochair.
- ◆ Special Issue of *Journal of Advanced Robotics* (scheduled for July 2009) on “Disaster Response Robotics.” Guest coeditors are Satoshi Tadokoro, TC emeritus chair; Matsuno Fumitoshi, TC cochair; Daniele Nardi, TC cochair; Adam Jacoff, NIST (USA).

The TC also aggressively updated its membership list and has been alerting members of activities throughout the year. The current membership list is 1,003 strong. A succession list of cochairs is being developed to keep the leadership fresh and involved. An exciting new plan is being developed to migrate the SSR TC to become one of the first proposed TCs as the next stage in the life of this

vibrant TC. The TC is sustaining an annual international workshop, as well as numerous other activities, so it is well poised to advance to a new level of permanence.

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POSITION

(continued from page 8)

representations, lifelong SLAM, and the integration of planning and SLAM.

My suggestion would be to focus on the aforementioned problems rather than on tiny aspects of existing SLAM algorithms. Instead of studying additional submapping approaches in SLAM or more efficient variants of particle filters, the robotics community requires techniques for real applications such as the lifelong coexistence of robots with humans in

domestic homes, navigation through rain forests, or dealing with objects and complex 3-D structures.

Summary

At least in my opinion, probabilistic techniques will continue to be the most robust approach to state estimation problems. They will serve as a powerful tool for understanding problems and the approximation of their optimal solutions.