IEEE/NIST Virtual Manufacturing Automation Competition
Advancing Robotic Research through an Open Source High-Fidelity Simulation Framework and Competition
PIs: Stephen Balakirsky, Ph.D., Raj Madhavan, Ph.D., and Chris Scrapper

Call for Participation

Background

Automated Guided Vehicles (AGVs) represent an integral component of today's manufacturing processes. They are widely used on factory floors for intra-factory transport of goods between conveyors and assembly sections, parts and frame movements, and truck-trailer loading/unloading. Automating these systems to operate in unstructured environments presents an exciting area of current research in robotics and automation. Unfortunately, the traditional entry barrier into this research area is quite high. Researchers need an extensive physical environment, robotic hardware, and knowledge in research areas ranging from mobility and mapping to behavior generation and scheduling. An accepted approach to lowering this entry barrier is through the use of simulation systems and open source software.

The PIs have received continued support under the *IE*EE Robotics and Automation Society's New Initiatives Competition for this purpose. In addition, they have extensive experience managing the open source Unified System for Automation and Robot Simulation (USARSim) systems (*http://www.sourceforge.net/projects/usarsim/*). It is our belief that competitions are an effective means of stimulating interest and participation among students by providing exciting technological problems to tackle.

Who Can Participate?

Under this effort, we are soliciting *faculty members and their interested students* from universities to be introduced to this time-critical research area. Student involvement is encouraged through the creation of a **National Virtual Manufacturing Automation Competition (VMAC)**. This competition is based on the successful VMA competition held in April 2008 and the RoboCup Rescue Virtual Competitions (*http://www.robocup-us.org/*). Since all code used in these competitions is open source, participants are able to learn from their competitors and self-sustain their research in their areas of expertise.

Researchers from multi-agent cooperation, robotic mapping and localization, communications networks, and sensory processing backgrounds are particularly encouraged to participate. The participants will be provided with the necessary equipment and knowledge needed to join the robotics and automation research community in the area of manufacturing automation. A two day tutorial will be provided during which the participants will be provided with all relevant software.

Interested?

Please contact us by August 22, 2008 with a succinct statement of how you expect to benefit from your participation and why you should be selected. If selected, you are expected to attend one of four regional two day tutorials (exact locations TBD). The actual competition will be held at the NIST campus in Gaithersburg MD, however virtual participation is possible.

Beyond the Competition …

Using a metrics-driven competition model, advancements in the various technologies comprising the AGV control system are quantified, helping the community gauge as well as target progress. It is our belief that this national competition will serve as a model for establishing a university-community focused on a real-world practical problem and an international competition to be held in conjunction with the annual IEEE International Conference on Robotics and Automation (starting from ICRA 2009).

The proposed effort will be administered under the IEEE Washington/Northern Virginia Section Robotics & Automation Society Chapter. It will also provide publicity and exposure to RAS in this geographic region resulting in increased memberships and renewed interest in the Society's related activities. RAS Chapters from across the United States are invited to be a sponsor of this competition by spreading the word among their members and helping us with the local organization of the regional tutorials.
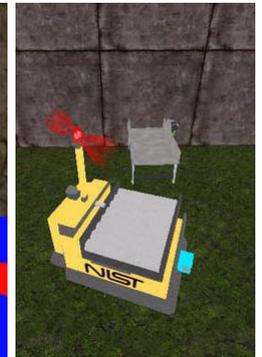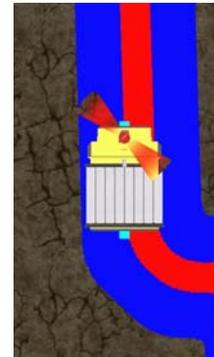
Contact Details:

Dr. Stephen Balakirsky
Dr. Raj Madhavan
Mr. Chris Scrapper
Intelligent Systems Division
National Institute of Standards
and Technology (NIST)
Gaithersburg, MD 20899-8230.

Email: robosim @nist.gov

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