IEEE/NIST Virtual Manufacturing Automation Competition
Advancing Robotic Research through an Open Source High-Fidelity Simulation Framework and Competition

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 IEEE Robotics and Automation Society has recognized the importance of this area by forming a new robot challenge competition that will take place annually at the International Conference on Robotics and Automation (ICRA). In addition, the National Institute of Standards and Technology will be administering a National Virtual Manufacturing Automation Competition (VMAC) that will provide an opportunity for well qualified teams to try their algorithms on actual robotic platforms. 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 at a workshop to be held at CMU. Student involvement is strongly encouraged This competition is based on the successful VMAC competition (*http://vmac.hood.edu*) 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 knowledge needed to join the robotics and automation research community in the area of manufacturing automation and will be provided with all relevant software. A full day tutorial will take place at each of the following three venues to introduce and discuss the simulation platforms and other associated details:

- Carnegie Mellon University/University of Pittsburgh: October 23rd 2008
- Georgia Institute of Technology: December 4th 2008
- University of California, Merced: December 11th 2008

Interested?

Please contact us with a succinct statement of how you expect to benefit from your participation. This year's National VMA Competition will be held at the NIST campus in Gaithersburg MD, and the International Competition will be held during ICRA '09 in Kobe Japan. For both events, 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 these competitions will serve as a model for establishing a university-community focused on a real-world practical problem.

This effort is administered under the IEEE Washington/Northern Virginia Section Robotics & Automation Society Chapter. 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.
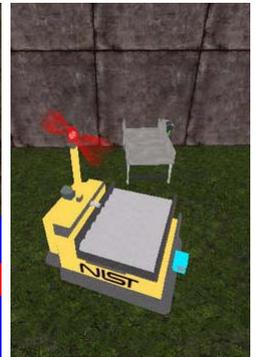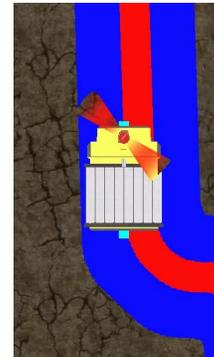
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