

IEEE ICRA 2010 Robot Challenge

Virtual Manufacturing Automation Competition (VMAC)

Team Description Papers due December 7, 2009

Call for Participation

Entries are sought for the **2010 Virtual Manufacturing Automation Competition (VMAC)** to be held in conjunction with the 2010 IEEE Intl. Conference on Robotics and Automation. Participation in the competition will consist of a software demonstration of a team of robots solving one or more of the pre-defined challenge tasks in the USARSim simulation environment. This demonstration may be performed remotely or on-site in the simulated environment set up for the competition.

The goal of the challenge is to provide an industrially relevant scenario and performance benchmarks to assess technologies in the areas of robot navigation in dynamic unstructured environments, mixed palletizing operations, and mobile manipulation. The competition's open source policy is designed to encourage collaboration and the dissemination of ideas and algorithms.

Competition Format

The competition will include several "elemental" tests as well as a full scenario. Teams are encouraged to participate in as many events as possible, with winners in each of the individual events as well as an overall winner being announced. Since this is a simulated event, perfect ground truth is available on such items as vehicle locations, package locations, package types, etc. It is desired that teams utilize as little of this information as possible, however, the organizers realize that most teams will require some help from ground truth. Teams must disclose their ground truth needs in their Team Description Paper (described below).

Events

A **Mixed Palletizing** task will test a team's ability to autonomously fill orders that a distribution center receives. The teams will have up to 3 robotic arms available, and each arm will work simultaneously on up to 3 pallets of materials. This test will consist of a circular conveyor of items (speed controlled by the team) from which team's must assemble a stable configuration of contents on the pallets as rapidly as possible.

A **Mobility** task will have team's autonomously deliver completed pallets throughout an unstructured factory environment. Teams will have up to 3 robotic platforms available for delivering the packages. When a package becomes available, the team must dock a robot with a loading conveyor to pick-up the package, and then deliver the package to one of several locations.

A **Scenario** will combine the two elemental tests into a single event. Teams will prepare pallets for transport and then move them throughout the factory environment to their destination.

What's Next?

Potential participants should submit a team description paper (TDP) of their intended entry to roboSim@nist.gov. The TDP should contain which challenge events your team will participate in, a high-level description of the algorithms that you will employ, requirements that you will place on the simulation system (i.e. what robots, sensors, and infrastructure you expect to need), and references to the team's relevant work in the area.

More information can be found on the **VMA Competition web page** at <http://www.vma-competition.com/>



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