The First Arizona Robotics Challenge 2008
— ASU vs. UoA

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In corporation with

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Web Page
http://asusrl.eas.asu.edu/srlab/Research/RoboticsChallenge.html

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About Arizona Robotics Challenge

The Arizona Robotics Challenge (ARC) aims at building a university-industry cooperation model through an annual event that consists of a series of educational and developmental activities, including learning, coaching, cooperation, problem solving, prototype developing, and competition in selected areas of computer applications. In the Challenge 2008 experiment, Intel offered project requirement, a faculty member builds and advises a team of senior capstone students to implement the requirement.

A theme of challenge will be defined for each year. For the 1st Arizona Robotics Challenge 2008, the theme is building security robots for autonomous and remote commanded patrolling of office environments. The system consists of one or multiple robots, wirelessly connected to a remote monitor station. The robots can patrol the building autonomously or commanded through the remote monitor station.

Three teams of students in their ASU senior capstone projects and two teams of students in their UoA senior capstone projects have participated in the Challenge 2008. They will demonstrate their security robots in the 2008 Competition, which will be held in an indoor office environment with a number of cubicles, as shown in the map on the back the flyer.

The Arizona Robotics Challenge 2008 is sponsored by Intel, in cooperation with ASU and UoA.

Competition 2008

The teams will demonstrate the ability of their robots in one or more of the following activities.

Activity 1: Learning Floor Plan
- The robot will start at a given location.
- The robot will have 5 minutes to traverse and learn floor plan.
- At the end of the learning process, the robot will generate a map and send the map to the monitor station. The map must be in the form of line boundaries. The map generated will be compared with the real map of the area.

Activity 2: Patrolling the Area
- The robot patrols the area for the given map for 3 minutes.
- The robot should cover as many subareas as possible.
- Surveillance video is sent to the monitor station constantly.

Activity 3: Object Detection
- A number of objects will be placed randomly within the area.
- On detection of an object, the robot must alert the monitor station and transmit the video of the object to the station. Then the robot proceeds to find other objects.

Activity 4: Intruder Detection
- While the robot is patrolling the area, an intruder (a person) will start moving within the area.
- The robot must detect the presence of the intruder and challenge the intruder by requesting the intruder to enter a pass code. In the meantime, the robot sends video with the intruder to the monitor station.
- The robot must follow the intruder if the intruder moves away from the current position.

Activity 5: Fire Detection
- The robot detects fire or an object with abnormal high temperature, such as boiling water.
- The robot generates alarm.

Other security features, such as motion detection, tamper recognition, and self-charging capacity can be demonstrated.

Winning robot on each activity, and the overall winning robot (win most activities) will be determined by judges, based on the performance and demonstration of the robots.