

Call for Participation

AAAI-97 Mobile Robot Competition and Exhibition

July 29-31, 1997 • Providence, Rhode Island

The Sixth Annual AAAI Mobile Robot Competition will consist of four events:

- Find Life on Mars
- Find the Remote Control
- Home Vacuum
- Hors d'Oeuvres Anyone? (Special Event)

Draft descriptions of each event follow. Competitors are responsible for checking the web site at <http://spbtrc.gtri.gatech.edu/AAAI97/> periodically to ensure that they have the most current versions of the rules. Rules committees for each event are being formed and the process of refining the actual events is underway.

AAAI will provide two pages each for up to fifteen of the entrants in the AAAI-97 *Proceedings*. Camera-ready versions must be submitted to the AAAI office by March 15, 1997. The organizers (including the exhibition organizer) will review these for appropriateness and if more than fifteen are received, will determine which will be published.

Event 1: Find Life on Mars

This mission is inspired by the upcoming Pathfinder Mission to Mars as well as the tantalizing (albeit limited) possibility of life on Mars as depicted by the recent meteorite analysis. There has also been recent emphasis by the US administration on robotic missions to Mars, so why not start at AAAI?

The robot will be placed in a large physically bounded area. In the area with the robot will be a variety of objects: unmodeled rocklike obstacles (both large and small), unusual small objects (unusual by virtue of color or shape) and moving Martians (squiggle balls). A significant number of the rocks will be small and movable, thus a blind sweeping of everything in the area would gather significantly more garbage than actual life forms, so a random strategy of picking up everything will not work.

The robot will start at a given location within the area near the center where the lander is located. The lander itself will be a pen, capable of containing the retrieved Martian samples. As power is at a premium, and time is of the essence (who knows what those Martians are up to), the robot's goal will be to explore the unmapped area surrounding the lander in the most efficient manner possible, retrieving as many of the Martian life forms to the lander as possible in the time allotted. The items retrieved will also need to be sorted into three possible classes: moving, stationary-1, and stationary-2.

It may be that some life forms are located underneath rocklike objects. There will

be clues to their presence, such as obvious trails or deposits ("Martian droppings") which can be used to determine which small rocks are worth knocking over (a simple but firm bump would be adequate to expose them).

Event 2: Where's the Remote?

This event is inspired by the need for robot assistants to perform "fetch-it" tasks in partially known environments. Imagine a robot assistant helping a handicapped person around the home. The person might ask the robot to fetch an orange, the TV remote, a cup of coffee, and so on. While the robot might not know where all of these items are initially, over time it will learn roughly where they are kept.

The event will take place in an arena that contains tables, chairs, and shelves at varying heights. Scattered throughout the area, on the floor, the shelves, and the tables, will be twelve different objects. The robot will start the event near a human sitting in a chair (i.e. judge) who will ask the robot to fetch three items. Once these items have been returned, the human will ask for three more items. The winner will be the robot that can find and return the most items in the allotted time.

Event 3: Home Vacuum

This task involves the creation of a robot (or robots) that are capable of effectively cleaning a one-bedroom (or studio) apartment—complete with natural furniture. The robotic system is assumed to start within a closet in the bedroom. "Dirt" confetti will be uniformly scattered throughout the two rooms. There will be some regions of high concentration of dirt as well. The robot's task is to come out during the day, while the owner is at work, and clean up the apartment. This should involve vacuuming under furniture (it may be moved as long as it is replaced) and in corners. Additional points will be provided for vacuuming the sofa. A map will be available of the apartment, including the layout of the furniture. The robot must return back to its home closet upon completion.

Event 4: Hors d'Oeuvres Anyone?

This event will occur at the AAAI main reception where there will be heavy interaction with the attendees, who will judge the event. The goal is to provide solid refreshments to the attendees in close quarters. Safety and self-protection are paramount. A human escort (one per team) will always be nearby for safety and control of the robot

(i.e., if it moves out of the designated area), but the escort's interaction with the attendees will be limited. The robots must be fully autonomous. The escort will also replenish the hors d'oeuvres on an as-needed basis. Preliminaries will be conducted prior to the reception to ensure that the robots are safe—both from harming the attendees as well as for their own self-protection.

At the reception, a large area will be available where the robots will be confined. (The size of the area will be available ahead of time). Attendees will be milling about, taking hors d'oeuvres from the robotic servers. All robots must be capable of carrying a standard tray. Human interaction is the key to success. The robots must move about autonomously within the reception area and can interact by speech, vision, tactile, infrared, etc., with potential servers. Personality counts here. If needed, the number of attendees in the area will be regulated to prevent overcrowding.

AAAI-97 Robot Exhibition

Have you wanted to bring a robot to AAAI, but don't have the resources to devote to programming a contest entry? Does your robot hardware not fit into the competition tasks? Do you want to enter the contest, but would also like to demonstrate the other work that you've been doing on your robot? Do you just want to show off your robot?

This year, we are expanding the exhibition portion of the annual robot competition and exhibition. We welcome robot demos, posters with or without robots present, and videos. If you would like to participate in this year's exhibition, please send email to Holly Yanco (holly@ai.mit.edu).

Robot Competition Cochairs

Ronald C. Arkin, Georgia Tech (arkin@cc.gatech.edu) and Jim Firby, University of Chicago (firby@cs.uchicago.edu)

Robot Exhibition Chair

Holly Yanco, Massachusetts Institute of Technology (holly@ai.mit.edu)

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Robin Murphy, Colorado School of Mines (rmurphy@mines.edu)

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