

Robot Platoon Command and Control

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MITRE Sponsored Research

The logo for the MITRE Technology Program, featuring a stylized graphic of stacked blocks in yellow, orange, and blue to the left of the text.

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Program

Background

Search and Rescue Tasks

- Find target(s) within a known space
 - Do mapping as needed
- Report target location
- Create extraction plan
- Perform extraction



New York, NY, September 21, 2001 -- These rescue workers emerge from the pile of rubble at the World Trade Center.

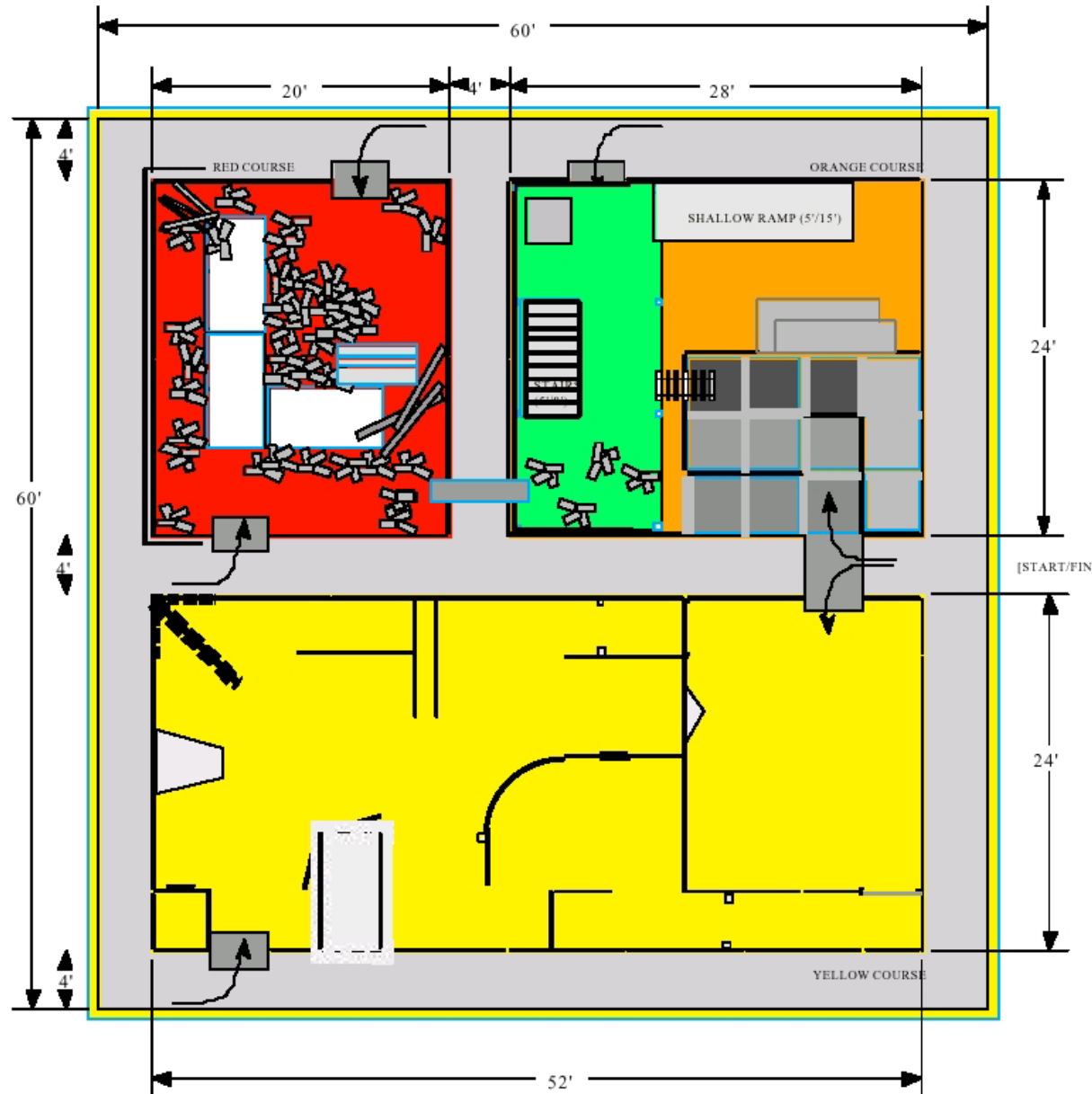
Photo by Andrea Booher/ FEMA News Photo

Our focus: search teams for target localization

Objective

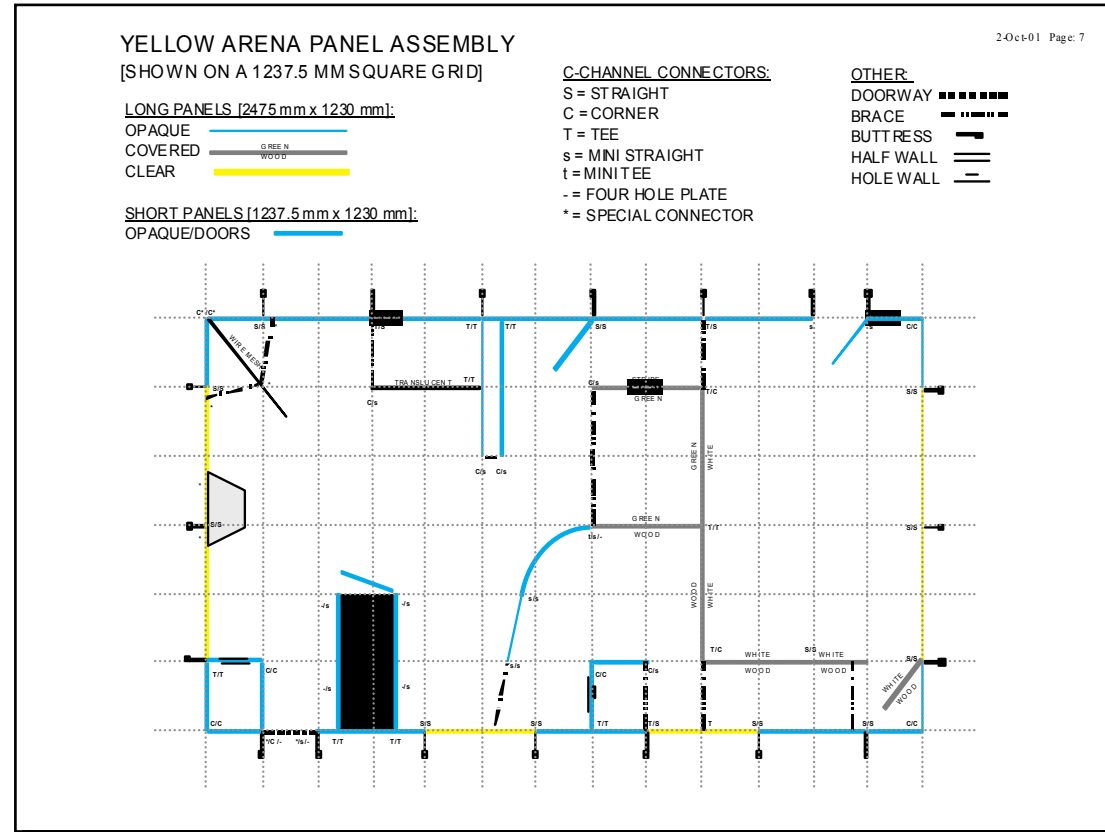
Demonstrate collaborative human-robot teaming

- Testbed: NIST Search and Rescue Test Course
- RoboCup-Rescue and AAI Search and Rescue Competitions



Activities

- Construct test course mockup
- Develop:
 - navigation
 - landmark localization
 - search coordination
- Prepare for AAAI-02 competition



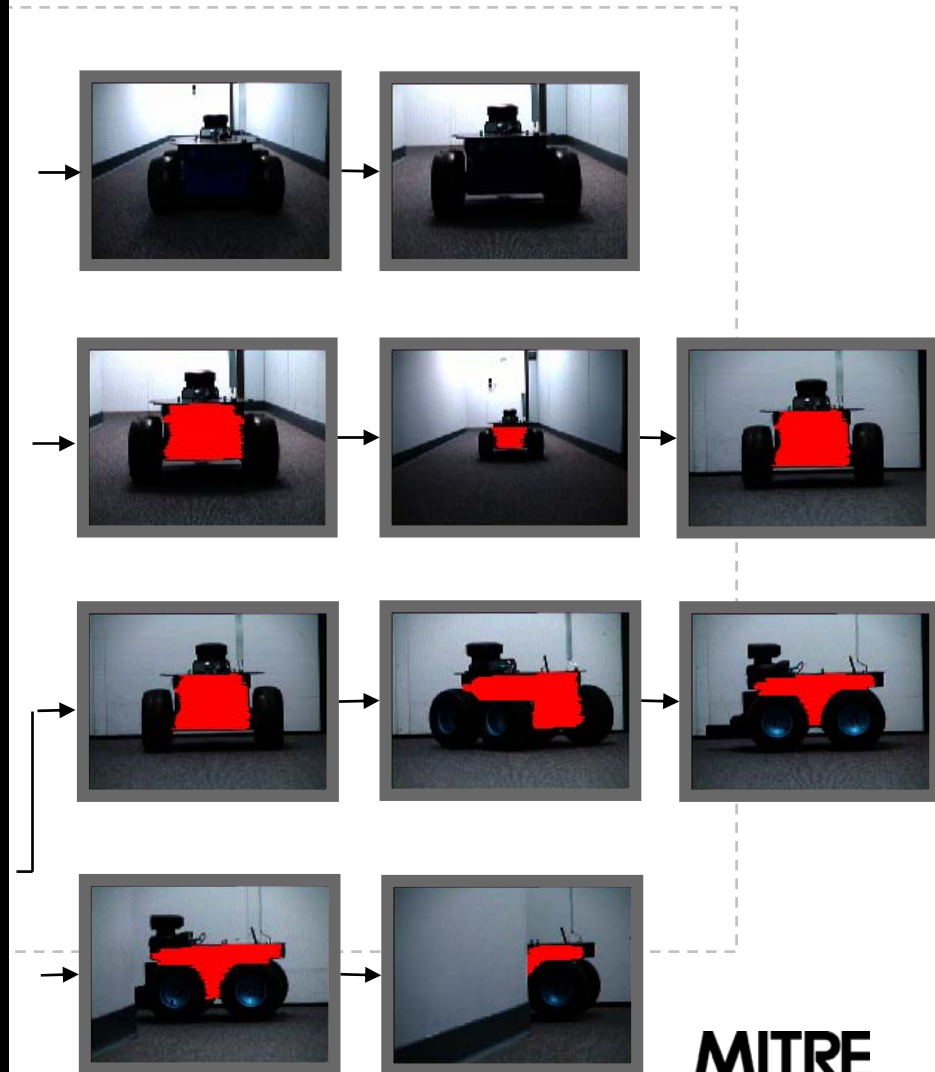
ActivMedia
Pioneer 2-AT
Robots

MITRE

Highlight

Color blob tracking

- Apparent target color changes depending on lighting, distance
- Apparent target size changes depending on distance
- Apparent target shape changes depending on
 - relative orientation
 - occlusion by obstacles

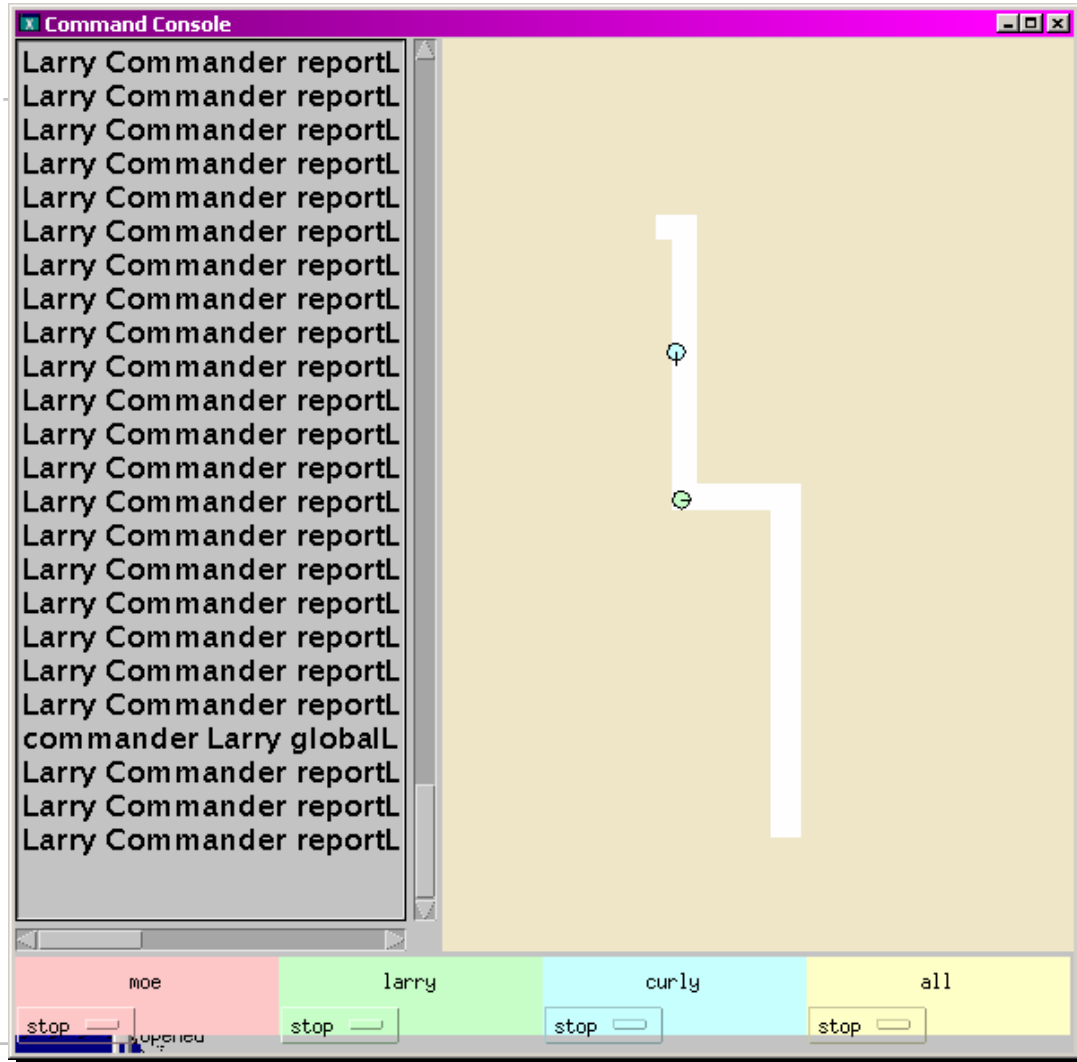


Highlight

Human Interface

Features:

- Message log
- Global map
 - positions, velocities
- Pull-down menus for commands



Impacts

- **Extend MITRE's expertise in command and control into the robotics domain**
- **Prepare to meet sponsor needs during the next 10 years**
 - **Future Combat Systems**
 - **Autonomous ground, sea, and air vehicles**
 - **Autonomous teaming and coordination**
 - **Automated reconnaissance**
- **Develop expertise in human-robot interaction**

Future Plans

■ Perception:

- motion detection
- heat sensing

■ Action:

- improved mobility with PackBot

■ Reasoning:

- integrated autonomous mapping
- robot recognition of situations that require human guidance

■ Human-Robot Interface:

- selectable teleoperation and integrated video from robots within the command console
- integrate PDA interface from multimodal command MSR project

