Multi-Agent Programming Contest 2011

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ProMAS, May 2, 2011
Outline

1. Aim
2. History
3. Multi-Agent Programming Contest 2011
4. Participation
Aim
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- Stimulate research in the area of **multi-agent systems programming**
- Identify **key problems**
- Collect **suitable benchmarks** that can serve as milestones for evaluating new tools, models, and techniques
- Gather test cases which require and enforce **coordinated actions**

**Challenge:**

Solve a cooperative task in a dynamically changing environment.
1st: The First CLIMA Contest – 2005

Scenario:
- Grid-like world
- Food and depot
- Goal: collect and store food

Competition:
- 4 participants

http://multiagentcontest.org/2005
2nd: The Second CLIMA Contest – 2006

Scenario:
- Grid-like world
- Gold and depot
- Goal: collect and store gold

Competition:
- Internet based environment provided by the organizers
- 3 participants

http://multiagentcontest.org/2006
3rd: Multi-Agent Programming Contest (ProMAS) – 2007

Scenario:
- Slight changes

Competition:
- 6 participants

4th: Multi-Agent Programming Contest (ProMAS) – 2008

Scenario:
- New scenario
- Cows and Cowboys
- Goal: Catch cows and herd them into the corral

Competition:
- 7 participants

http://multiagentcontest.org/2008
5th: Multi-Agent Programming Contest 2009

Scenario:
- Slight changes

Competition:
- 8 participants

http://multiagentcontest.org/2009
6th: Multi-Agent Programming Contest 2010

Scenario:
- Slight changes

Competition:
- 8 participants

http://multiagentcontest.org/2010
Multi-Agent Programming Contest 2011
Agents on Mars

Focus on:

- agent cooperation and agent coordination
- team decentralization

Challenge

Occupy the biggest zones and earn a lot of money!

$$\text{score} = \sum_{s=1}^{\text{steps}} (\text{zones}_s + \text{money}_s)$$
Teams & All Terrain Planetary Vehicles

- **Explorer**: skip, goto, probe, survey, buy, recharge
  - Energy: 12  
  - Health: 4  
  - Strength: 0  
  - Visibility range: 2

- **Repairer**: skip, goto, parry, survey, buy, repair, recharge
  - Energy: 8  
  - Health: 6  
  - Strength: 0  
  - Visibility range: 1

- **Saboteur**: skip, goto, parry, survey, buy, attack, recharge
  - Energy: 7  
  - Health: 3  
  - Strength: 4  
  - Visibility range: 1

- **Sentinel**: skip, goto, parry, survey, buy, recharge
  - Energy: 10  
  - Health: 1  
  - Strength: 0  
  - Visibility range: 3

- **Inspector**: skip, goto, inspect, survey, buy, recharge
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Disabled Agents

Agents with health zero are disabled:
- Only the action goto, repair, skip are executable
- The recharge rate is set to 10 percent.
Money

Achievements:

- Having zones with fixed values, e.g. 10 or 20,
- Fixed numbers of probed vertices, e.g. 5 or 10,
- Fixed numbers of surveyed edges, e.g. 10 or 20,
- Fixed numbers of inspected vehicles, e.g. 5 or 10,
- Fixed numbers of successful attacks, e.g. 5 or 10, or
- Fixed numbers of successful parries, e.g. 5 or 10.
Percepts

In every step, the agents get these percepts:

- Current step,
- Current scores and money,
- Agents internals,
- Visible vertices,
- Visible edges,
- Visible vehicles,
- Probed vertices,
- Surveyed edges,
- Inspected vehicles.
Simulation State Transition

The simulation state transition is as follows:

- Collect all actions from the agents,
- Let each action fail with a specific probability,
- Execute all remaining attack and parry actions,
- Determine disabled agents,
- Execute all remaining actions,
- Prepare percepts,
- Deliver the percepts.
Participation
Developing your Agents

**Software Package**: [http://multiagentcontest.org/2011](http://multiagentcontest.org/2011)

- MASSim-Server including the new Agents-on-Mars-scenario,
- Monitor for inspecting and visualizing the environment,
- Java-based environment-interface that facilitates connecting to the server,
- Set of simple dummy-agents for testing purposes, and
- Detailed documentation on all components of the package.

**Mailing list**

**Address**: agentcontest2011-subscribe@in.tu-clausthal.de

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- **June 2011**: release of the final software package.
- **August 2011**: registration phase.
- **Until September 2011**: testing phase.
- **September 2011**: tournament.

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References

Behrens, Dastani, Dix, Köster, and Novák
Special Issue: The Multi-Agent Programming Contest: History and Contestants in 2009

Thank you for your attention!

Questions?