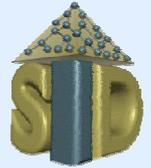




3D Monitoring of Distributed Multiagent Systems



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Goals

Problem:

- Debugging and monitoring distributed systems composed of multiple cooperative agents with a common goal is a challenging task, and techniques different from those used in other distributed systems are required.
- The scalability of a solution based on analyzing log files by hand is very poor, unmanageable even with a moderate set of agents and interesting events.

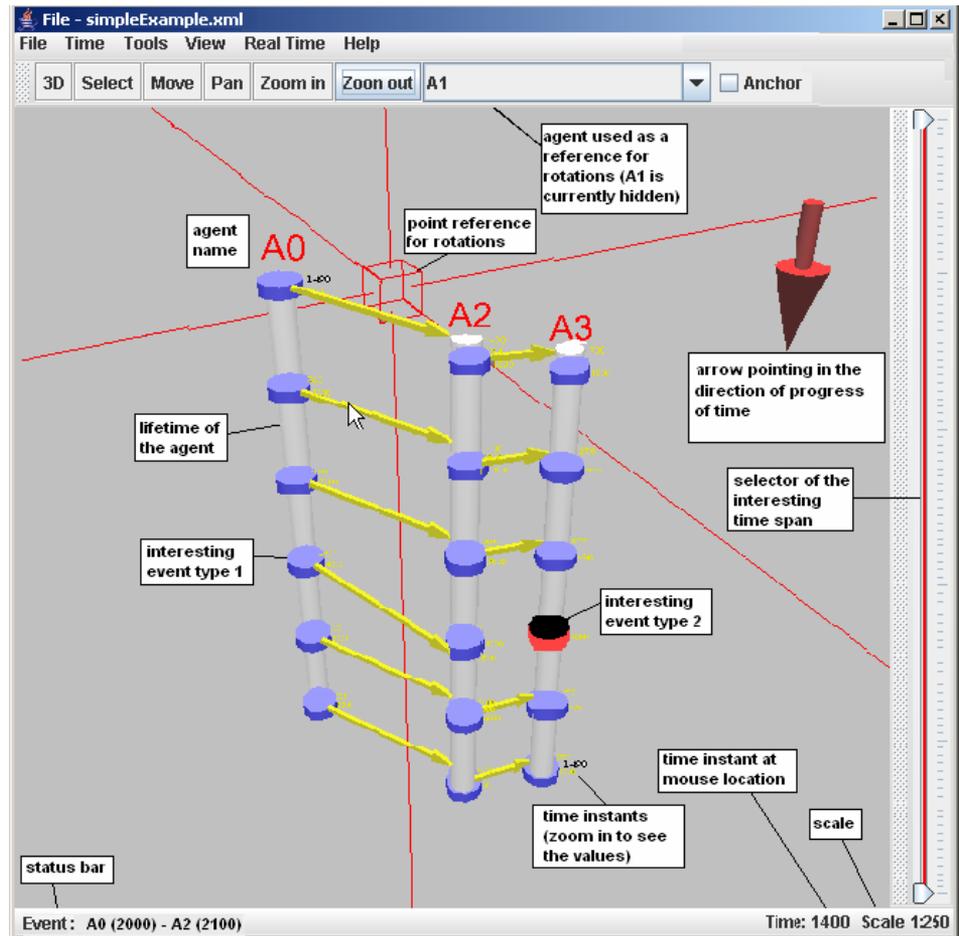
Solution:

We propose a graphical monitoring framework that supports querying and interacting in a 3D scenario (two spatial dimensions, one temporal dimension) in order to find and visualize appropriately the relevant elements of the agents' interactions and actions occurring along time.

Features:

- 3D visualization.
- On-line and off-line analysis.
- Query-based filtering of events:
 - Queries for visualization.
 - Information queries (e.g., statistics).
- Extensible (with new functionalities and graphical elements).
- Not specific to a particular multi-agent system.

Overview of ADAM3D



Our Proposal (see Figure)

- The lifetime of agents is denoted with cylinders that indicate the passing of time.
- Arrows indicate communications among agents. The slope of the arrow indicates the delay.
- Agents' events are represented using circular rings of different colors, around the cylinder of the involved agent.
- A status bar shows information related to the event/agent pointed to by the mouse.
- The agents are automatically placed on the scenario in suitable locations to facilitate interaction and visualization.

Advantages of Using 3D

- Time dimension is part of the representation, offering a global view instead of focusing on one time instant (e.g., you can see the duration of communications).
- Using 2D, it would be difficult to show the communications among the agents along time (arrows would cross over each other).
- It enhances the user interaction.

Contact

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Interaction Facilities

- Selecting the interesting time span, jumping to a specific time instant.
- Moving and rotating the scenario.
- Scaling the scenario (zooming in/out).
- Automatic adjustment of the point of view.
- Moving agents.
- Hiding agents.
- Selecting sets of agents, to apply operations over all of them.
- Filtering of events using queries.

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