2015 Agent-Directed Simulation (ADS'15) Symposium

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The **Agent-Directed Simulation (ADS) Symposium** is the premier platform to explore all three aspects of the synergy of simulation and agent technologies. Hence, it has a special place within simulation and agent conferences, including agent-based (social) simulation conferences. Therefore the ADS symposium fills a gap in the agent community as well as the simulation community.

The purpose of the ADS symposium is to facilitate dissemination of the most recent advancements in the theory, methodology, application, and toolkits of agent-directed simulation. Agent-directed simulation is comprehensive in the integration of agent and simulation technologies, by including models that use agents to develop domain-specific simulations, i.e., agent simulation (this is often referred to as agent-based simulation -when other two important aspects are not considered), and by also including the use of agent technology to develop simulation techniques and toolkits that are subsequently applied, either with or without agents.
Hence, agent-directed simulation consists of three distinct, yet related areas that can be grouped under two categories as follows:

- *Simulation for Agents (agent simulation)*: simulation of agent systems in engineering, human and social dynamics, military applications etc.
- *Agents for Simulation* (which has two aspects): agent-supported simulation deals with the use of agents as a support facility to enable computer assistance in problem solving or enhancing cognitive capabilities; and agent-based simulation that focuses on the use of agents for the generation of model behavior in a simulation study.

Through the theme of agent-directed simulation, the symposium will bring together agent technologies, tools, toolkits, platforms, languages, methodologies, and applications in a pragmatic manner. In this symposium, researchers, educators, and students are encouraged to come together and discuss the benefits of agent technology in their use and application for simulation. It is a venue for practitioners to discuss why and how they have used agent technology in their simulations, and describe the benefit of having done so. The theme of ADS'15 is based on the observation of the following premises:

- The growth of new advanced distributed computing standards along with the rapid rise of e-commerce are providing a new context that acts as a critical driver for the development of next generation systems. These standards revolve around service-oriented technologies, pervasive computing, web-services, Grid, autonomic computing, ambient intelligence etc. The supporting role that intelligent agents play in the development of such systems is becoming pervasive, and simulation plays a critical role in the analysis and design of such systems.
- The use of emergent agent technologies at the organization, interaction (e.g., coordination, negotiation, communication) and agent levels (i.e. reasoning, autonomy) are expected to advance the state of the art in various application domains. However, modeling and testing complex agent systems that are based on such technologies is difficult. Using agent-supported simulation techniques for testing complex agent systems is up and coming field.
- To facilitate bridging the gap between research and application, there is a need for tools, agent programming languages, and methodologies to analyze, design, and implement complex, non-trivial agent-based simulations. Existing agent simulation tools are still not mature enough to enable developing agents with varying degrees cognitive and reasoning

capabilities.

ADS 2015 will provide a leading forum to bring together researchers and practitioners from diverse simulation societies within computer science, social sciences, engineering, business, education, human factors, and systems engineering. The involvement of various agent-directed simulation groups will enable the cross-fertilization of ideas and development of new perspectives by fostering novel advanced solutions, as well as enabling technologies for agent-directed simulation.

Topics

Theory/methodology
- High-level agent specification languages for modeling and simulation.
- Agent programming and simulation modeling languages.
- Distributed simulation for multi-agent systems.
- Formal models of agents and agent societies.
- Advanced agent features for agent-directed simulation: e.g.:
    - Holonic agents for cooperation and coopetition modeling and simulation.
    - Agents with personality, agents with dynamic personality, agents with emotions, agents having different types of intelligence such as emotional intelligence, agents with multi-intelligence.
    - Influence of cultural backgrounds in agent-directed simulation.
    - Agents with several types of understanding abilities such as multivision and switchable understanding abilities, trustworthy agents, and moral agents in simulation.
    - Agent-based simulation to monitor multi-simulation studies.
    - Agents in design and monitoring of simulation experiments and analysis of results.
    - Verification, validation, testing; quality assurance; as well as failure avoidance in agent-directed simulations.

Technology, tools, toolkits, and environments
- Agent infrastructures and supporting technologies (e.g., interoperability, agent-oriented software engineering environments).
- Modeling, design, and simulation of agent systems based on service-oriented technologies, pervasive computing, web-services, grid computing, autonomic computing, ambient intelligence.
- Agent architectures, platforms, and frameworks.
- Standard APIs for agent simulation programming.

Applications
- Simulation modeling of agent technologies at the organization, interaction (e.g., communication, negotiation, coordination, collaboration) and agent level (e.g., deliberation, social agents, computational autonomy).
- Application of agent simulations in various areas such as biology, business, commerce, economy, engineering, environment, individual, group, and organizational behavior, management, simulation gaming/training, social systems.
- Conflict management simulation with holonic agents.
- Modeling and simulation of emergence.

Submission Guidelines

Contributed papers are 8-10 pages long. They will be peer reviewed and – if accepted and presented at the conference - submitted to the ACM Digital Library.

Posters will be peer reviewed and feedback will be provided. If accepted, they will be presented in the poster session of SpringSim'14. Poster authors are encouraged to submit a one page summary for inclusion in the proceedings, but they will not be submitted to an indexed archive.

Submission Guidelines