



*Call for Participation*

# 2007 AAAI Fall Symposium Series

November 8–11, 2007  The Westin Arlington Gateway, Arlington, Virginia

*Sponsored by the Association for the Advancement of Artificial Intelligence*

With support from the Naval Research Laboratory

445 Burgess Drive, Menlo Park, California 94025  650-328-3123  650-321-4457 (fax)  [www.aaai.org/fss07.php](http://www.aaai.org/fss07.php)

## Important Deadlines

May 1, 2007: Submission due to organizers

May 21, 2007: Notifications of acceptance sent by organizers

September 14, 2007: Accepted camera-ready copy due to AAAI.

## URL

[www.aaai.org/fss07.php](http://www.aaai.org/fss07.php)



*Photo courtesy Arlington Convention and Visitors Bureau*

The Association for the Advancement of Artificial Intelligence is pleased to present the 2007 Fall Symposium Series, to be held Friday through Sunday, November 9-11, at the Westin Arlington Gateway in Arlington, Virginia. The Symposium Series will be preceded on Thursday, November 8 by a one-day AI funding seminar, which will be open to all registered attendees of FSS-07. The topics of the seven symposia are:

- AI and Consciousness: Theoretical Foundations and Current Approaches
- Artificial Intelligence for Prognostics
- Cognitive Approaches to NLP
- Computational Approaches to Representation Change during Learning and Development
- Emergent Agents and Socialities: Social and Organizational Aspects of Intelligence
- Intelligent Narrative Technologies
- Regarding the “Intelligence” in Distributed Intelligent Systems

An informal reception will be held on Friday, November 9. A general plenary session, in which the highlights of each symposium will be presented, will be held on Saturday, November 10. Symposia will be limited to 40-60 participants each. Participation will be open to active participants as well as a limited number of interested individuals on a first-come, first-served basis. Each participant will be expected to attend a single symposium. Working notes will be prepared and distributed to participants in each symposium. Registration information will be available on the AAAI web site in July 2007.

To obtain registration information, write to:

AAAI Fall Symposium Series  
445 Burgess Drive  
Menlo Park, CA 94025-3442  
650-328-3123 650-321-4457 (fax)  
[fss07@aaai.org](mailto:fss07@aaai.org)  
[www.aaai.org/fss07.php](http://www.aaai.org/fss07.php)

## Submission Requirements

Interested individuals should submit a paper or abstract by the deadline listed below. For AAAI formatting guidelines, please see <http://www.aaai.org/Publications/Author/author.php>. Please mail your submissions directly to the chair of the individual symposium according to their directions. Do not mail submissions to AAAI.

# AI and Consciousness: Theoretical Foundations and Current Approaches

In recent years there has been a growing interest in the field of consciousness from biological, psychological, philosophical, and computational points of view. At the same time, several artificial intelligence researchers have designed and implemented systems that take into account the suggestions from the study of consciousness. On one hand, there is the hope of being able to design better AI programs; on the other hand, the actual implementations of working systems could be helpful for understanding consciousness.

The current generation of autonomous robots shows impressive performance with respect to the mechanics and the control of movements. However, these robots, currently at the state of the art in control theory, present limited capabilities of perception, reasoning and action in novel and unstructured environments. A new generation of AI and robotics systems could greatly benefit from research on consciousness in terms of novel approaches for the design of robot sensors and actions modules, of internal and self-representations, and of relevant planning and anticipation capabilities.

The main goal of the symposium is to bring together researchers from AI, cognitive science, philosophy, and psychology to reason about the question: can we build better AI and robotics systems by facing the problem of consciousness?

Related questions considered in discussions and talks will be as follows:

- Are models of consciousness useful for AI?
- Are AI systems useful for understanding consciousness?
- What are the theoretical foundations of machine consciousness?
- Is machine phenomenology possible?
- Will conscious systems perform better than unconscious systems?
- What are the implementation issues of current AI systems inspired by consciousness?

The symposium will provide extensive discussions and group interactions in which to present the current state of research and to discuss the experimental results and the theoretical foundations of the field of consciousness and their relationships with artificial intelligence.

The symposium will schedule key invited speakers and selected talks from authors. Authors are encouraged to submit their work in long papers

and in position papers. A limited amount of support is available for students.

## Submissions

Please e-mail submissions using the two-column AAAI conference paper format as PDF to [chella@unipa.it](mailto:chella@unipa.it). Long papers should be at most six pages; position papers should be at most two pages.

## Symposium Chairs

Antonio Chella, University of Palermo ([chella@unipa.it](mailto:chella@unipa.it)) and Riccardo Manzotti, IULM University, Milan ([riccardo.manzotti@iulm.it](mailto:riccardo.manzotti@iulm.it))

## Organizing Committee

Luigia Carlucci Aiello, University of Rome “La Sapienza;” Igor Aleksander, Imperial College, London; Bernard J. Baars, The Neurosciences Institute, San Diego; Josh Bongard, University of Vermont; Ron Chrisley, University of Sussex; Stan Franklin, The University of Memphis; Benjamin Kuipers, The University of Texas at Austin; Murray Shanahan, Imperial College, London; Christof Koch, California Institute of Technology

## For More Information

For more information about the symposium see the supplementary symposium web site ([www.consciousness.it/CAI/CAI.htm](http://www.consciousness.it/CAI/CAI.htm)).

# Artificial Intelligence for Prognostics

Over the last ten years, there has been substantial interest and investment in prognostics in aerospace, transportation, and other industries. The field of prognostics focuses on methods and tools to determine functional degradation of components and systems and to estimate remaining useful life. The ultimate goal of prognostics is to manage the remaining useful life of systems such that maintenance actions can be performed “just in time” prior to failure, thus increasing safety as well as reducing maintenance expenses due to unscheduled downtime or unnecessary preventive maintenance. Given accurate remaining life estimates, prognostics also aims to manage the accumulation of further damage through control actions, for example, by either redistributing the load onto other components or changing the mission profile by trading off secondary mission goals.

These days, the hype around prognostics rivals the early days of artificial intelligence. Nevertheless, in practice, accurate prognostics has proven rather difficult to accomplish. There are numerous issues that still need to be resolved before prognostics is adopted as standard practice in the industry. These issues include the following:

- How does one successfully manage uncertainty of the prediction without incurring inadmissibly large confidence bounds that would wipe out the benefits?
- How does one validate prognostic techniques for new and expensive systems for which no historical data exist?
- How does one treat post-prognostic decision making that involves a tradeoff between numerous criteria including cost, risk, and logistics while some of these criteria change dynamically?
- How does one provide comprehensive coverage for a large number of fault modes that make a detailed materials-based approach infeasible for all fault modes?
- How does one communicate the information between different components and arrive at a complete system-wide health status that properly accounts for the interactions between different components?
- How does one perform online (or offline) re-configuration that avert impending system failure within the framework of complex systems?

This symposium will explore the contributions that artificial intelligence and computational in-

telligence can make to this rapidly growing field. The AAAI Symposium Series provides the AI community with a unique venue in which researchers from different areas of AI can present speculative work and work in progress, hold focused discussions over several days, build new communities for emerging disciplines, and build ties between existing disciplines.

## Submissions

To indicate interest and receive symposium related updates, please send e-mail to [goebel@mail.arc.nasa.gov](mailto:goebel@mail.arc.nasa.gov).

## Organizing Committee

Gautam Biswas, Vanderbilt University; Piero Bonissone, GE Global Research; Kai Goebel, RIACS, NASA Ames Research Center; Andrew Hess, Consultant (retired, US Navy-JSF Program Office); Michael Roemer, Impact Technologies; Serdar Uckun, NASA Ames Research Center; George Vachtsevanos, Georgia Institute of Technology

## For More Information

For more information about the symposium see the supplementary symposium web site ([www.goebel5.org/aifp](http://www.goebel5.org/aifp)).

This symposium is designed to highlight NLP research at the intersection of AI/computational linguistics and cognitive science/computational psycholinguistics—especially research that integrates symbolic and statistical or connectionist representations with serial and parallel processing mechanisms into large-scale, functional, cognitively- motivated (or better yet, cognitively plausible) NLP systems.

## Topics

Major topics of discussion are expected to include the following:

- Cognitive/hybrid approaches to parsing and text meaning analysis
- Cognitive/hybrid approaches to generation• Cognitive/hybrid approaches to knowledge representation (KR) and reasoning
- Cognitive/hybrid approaches to knowledge acquisition
- Cognitively-motivated implementations of NLP and information extraction (IE) systems
- Applying cognitive architectures to build functional NLP systems
- Evaluations, advantages and disadvantages of cognitively-motivated NLP systems

This symposium will be of special interest to researchers interested in building cognitively-motivated, large-scale, real-world NLP systems, although researchers interested in building more specialized systems may also want to participate. Researchers engaged in this interdisciplinary area of research are consumers of experimental and theoretical research in psycholinguistics and human language processing without necessarily being psycholinguists or experimental psychologists. However, attempts to build large-scale, cognitively motivated NLP systems are likely to reveal weaknesses in cognitive theories of language representation and processing, which will provide important feedback to more experimentally and theoretically oriented researchers.

A key assumption underlying this symposium is the idea that adhering to well- established cognitive constraints on language processing may actually facilitate, rather than hinder, the development of functional NLP systems. The adoption of such cognitive constraints narrows the search space for possible solutions, focusing attention in research directions that are more likely to lead to feasible systems than the reliance on brute force computational mechanisms like exhaustive

search and algorithmic backtracking, which are both cognitively implausible and computationally intractable.

A major goal of this symposium is to identify issues that need to be overcome in the development of large-scale, cognitively-motivated NLP systems, and to highlight emerging techniques and solutions for addressing these issues.

## Submissions

Prospective participants are invited to submit research (up to 8 pages) or position (2 pages) papers, in PDF or Word format using AAAI guidelines, to Jerry Ball ([jerry.ball@mesa.afmc.af.mil](mailto:jerry.ball@mesa.afmc.af.mil)). All submissions will be reviewed by the program review committee. Accepted papers will be presented at the symposium and published in the AAAI technical report series.

## Organizing Committee

Jerry Ball, Air Force Research Laboratory, Human Effectiveness Directorate; Krishna Jha, Lockheed Martin Advanced Technologies Laboratories; Sergei Nirenburg, University of Maryland Baltimore County; Marjorie McShane, University of Maryland Baltimore County

## For More Information

For more information about the symposium see the supplementary symposium web site ([www.doublertheory.com/AAAIFallSymposium2007.htm](http://www.doublertheory.com/AAAIFallSymposium2007.htm)).



Photo courtesy Arlington Convention and Visitors Bureau

# Computational Approaches to Representation Change during Learning and Development

In nearly every subfield of AI, it is both true and well known that using the right representation is crucial. For example, moving from state-space planning to plan-space planning can make previously intractable problems solvable. Representation change is likewise implicated in psychological accounts of learning and problem solving, ranging from the relatively mundane to more significant “aha! moments” where an insight leads to problem reorganization and a breakthrough. Representation change also features prominently in many accounts of perceptual and cognitive development, and in some cases, such as that of Jean Piaget’s constructivism, it is the driver of cognitive development.

The goal of this symposium is to bring together researchers from a diverse set of fields (such as artificial intelligence, machine learning, cognitive and developmental psychology, cognitive science, and philosophy) to survey the state of the art and establish a set of open problems and a research agenda in the area of automated development and, more specifically, change of representation. Submissions that emphasize computational mechanisms, present animal and human evidence of representation change, or propose learning and problem solving scenarios that require representation change are particularly encouraged.

Topics of interest include, but are by no means limited to, the following:

- What learning frameworks (for example, statistical or logical) and algorithms (such as reinforcement-learning algorithms, Bayesian learning algorithms, Inductive Logic Programming algorithms) are most amenable to ongoing change of representation?
- What classes of representations can support dynamic change? What is changing, what is gained, and what is lost in the process?
- What computational mechanisms are appropriate for representation change, especially given the issues of (time and sample) complexity and overfitting that arise when searching simultaneously over representations and hypotheses couched in those representations?
- How can we characterize representation change (that is, characterizing qualitative versus quantitative change)?
- How can the value of a representation be defined and measured, and how can the quality of different representations be compared?

- When can representation change hurt performance?
- What are computational accounts of perceptual and cognitive development that feature representation change?
- What mechanisms are best for triggering change of representation as opposed to re-learning within a fixed representation?
- How can learners move beyond their innate sensor endowment by positing hidden variables or theoretical entities, thereby extending their representational repertoire?

## Submissions

Prospective participants are invited to e-mail a research paper (up to 8 pages) or position statement (up to 2 pages) using the standard AAAI format to Clayton Morrison ([clayton@isi.edu](mailto:clayton@isi.edu)).

## Organizing Committee

Clayton T. Morrison (cochair), University of Southern California Information Sciences Institute; Tim Oates (cochair), University of Maryland Baltimore County; Michael L. Littman, Rutgers University; Charles L. Isbell, Georgia Institute of Technology; Edwin D. de Jong, Universiteit Utrecht

## For More Information

For more information about the symposium see the supplementary symposium web site ([www.vertle.isi.edu/~clayton/aaai-fss07](http://www.vertle.isi.edu/~clayton/aaai-fss07)).

# Emergent Agents and Socialities: Social and Organizational Aspects of Intelligence

The study of agency and multiagent systems crosses disciplinary boundaries by focusing on society, culture and communication as emerging from interactions of autonomous agents. Poised at the intersections of AI, cybernetics, sociology, semiotics and anthropology, this strand of multi-agent systems research enables a powerful perspective illuminating not only how we live and learn, but also, through focusing on emergence, how we anticipate the future.

This symposium focuses on second order emergence. The constituents in a system are aware of an emergent phenomenon and adapt accordingly. New agents emerge as human and nonhuman agents interact, hinting at new qualities that may enable us to push the use of technology to its maximum capacity, and in the process imbricating both the observer and the observed in successive cycles of emergence.

In most studies to date, the nonhuman agent is subordinate to the human agents. Without the human input (and in the absence of another obstacle), the nonhuman agent goes nowhere. On the other hand, if we look at these interactions as emergent socialities, the nonhuman agent has a pivotal role—that of amanuensis for all subsequent social interaction. That is, without the nonhuman agent, there can be no emergent social interaction to begin with.

Theories of emergence suggest a dynamic, multi-directionality of perception organized socially as multi-agent systems. What is less studied is the messiness of those multi-agent systems themselves, the way they involve complex “translations” between human and non-human agents, or “transcodings” between different representational and discursive modalities.

This symposium proposes to delve into the messiness of the social, approaching it from multiple perspectives simultaneously—computational, sociological, linguistic and cybernetic—in such a way as to stimulate our own sites of emergence at the borders of these disciplines.

## Focal areas

- Concepts, definitions and theories
- Cognitive aspects of emergence in interactions
- Tools and methods for studying emergent phenomena
- Simulations and experiments in agency, in-

teraction, and emergence

- Emergent of society, and societal phenomena
- Organization and societies, interaction and communication

## Submissions

Those interested in participating in this symposium should send either a full paper (8 pages maximum) or a position paper (1–2 pages) in AAAI format in PDF to [interaction.emergence@gmail.com](mailto:interaction.emergence@gmail.com) or using alternative arrangements as posted at the URL below. Please submit all questions to Goran Trajkovski at [gtrajkovski@towson.edu](mailto:gtrajkovski@towson.edu).

## Organizing Committee

Goran Trajkovski (cochair), Towson University, USA; Samuel Collins (cochair), Towson University, USA; Laslo Gulyas, AITIA International Inc., Hungary; Michael North, Argonne National Laboratories, USA; Keith Sawyer, Washington University in St Louis, MO, USA; Richard Schilling, Cognition Group Inc, USA; Georgi Stojanov, American University in Paris, France

## For More Information

For more information about the symposium see the supplementary symposium web site ([pages.towson.edu/gtrajkov/FSS07](http://pages.towson.edu/gtrajkov/FSS07)).

# Intelligent Narrative Technologies

Narrative is a pervasive aspect of human culture in both entertainment and education. As the reliance on digital technology for both entertainment and education technology increases, the need for more innovative approaches to represent, perform, and adapt narrative experiences increases as well. The term “narrative intelligence” was coined to refer to the ability in both humans and computers to organize experience into narrative form. Previous and current work in this field has produced results in narrative understanding, narrative generation, storytelling user interface modalities, narrative performance by autonomous embodied agents, cognitive models of narrative, and common-sense reasoning.

Our goal is to bring together a multidisciplinary group of researchers interested in discussing the fundamental issues in representing, presenting, adapting, and reasoning about narrative in digital media. To this end we invite AI researchers interested in interactive and noninteractive narrative, psychologists, narrative theorists, media theorists, and members of the interactive entertainment industry to contribute to the symposium. We intend to interleave paper presentations with creative, collaborative working sessions and innovative programming, such as an improvisational acting workshop. Contributors are encouraged to send in papers describing completed or ongoing research, and proposals for discussion topics that will be of interest to the community at large.

## Topics

- Narrative/story understanding/generation (agents, in the context of narrative performance, believability, emotion, personality, autonomy)
- Interactive narrative/storytelling systems
- Authoring tools and narrative co-construction support tools
- Computational models of narrative
- Narrative psychology, theory, and narratology
- Narrative in commonsense reasoning
- Narrative in intelligent learning environments, serious games, and edutainment
- Narrative in commercial and experimental interactive entertainment
- Narrative structure in interface design
- Complimentary technologies (virtual cinematography, computational models of cre-

ativity and aesthetics, natural language generation/understanding for narrative, music generation for dramatic effect)

- Production/comprehension

Due to the broad and multidisciplinary nature of narrative studies, we will also seriously consider other complimentary topics that are not included on the list.

## Submissions

We welcome submissions describing (1) finished or ongoing relevant research and systems, including theories and models that can inform the development of systems; and (2) proposals for discussion topics that will be of interest to the symposium. Long papers should be at most 8 pages; short papers should be at most 4 pages. Please submit electronically in PDF format following AAAI style guidelines to [magerko@msu.edu](mailto:magerko@msu.edu).

## Organizing Committee

Brian Magerko (cochair), Michigan State University; Mark Riedl (cochair), University of Southern California; Bryan Loyall, BAE Systems; Michael Young, North Carolina State University; Michael Mateas, University of California, Santa Cruz

## For More Information

For more information about the symposium see the supplementary symposium web site ([gel.msu.edu/aaai-fs07-int/](http://gel.msu.edu/aaai-fs07-int/)).

# Regarding the “Intelligence” in Distributed Intelligent Systems

A look across application areas and diverse products reveals that a reoccurring keyword is “intelligence.” In areas such as web intelligence for business applications, coordination of robotic teams for NASA’s exploration vision, DOD’s net-centric approach, and network security, all applications are expected to incorporate “intelligence.” The intelligence may be required for an application to succeed, or it may be an enhancement over a “dumber” version; the keyword “intelligence” now serves as a system or product discriminator. “Intelligence” may also emerge from simpler interactions within the distributed system. The definition and focus of “intelligence” also seems to be varied. One of the newest application areas involves “humans in the loop” via distributed social intelligence. An element of the “intelligence” in this area involves tapping into collective human opinion.

The development of intelligence is the overarching focus of the artificial intelligence field. To this end, various paradigms have been developed that offer approaches to support the development of “intelligence” within an application. Among these paradigms are the bioinspired or biomimetic, social or organizational-based, algorithm-based, cognitive, logic-based, knowledge-based, hybrid, etc. Additionally, methodologies that are utilized to build intelligent systems may include intelligence technology themselves. For example, software verification and validation efforts may utilize theorem provers based on computational logic.

This symposium will provide a venue to consider, as a set, the (1) paradigms and associated algorithms that support intelligence and (2) distributed systems that incorporate intelligence, with enabling methodologies for expression of intelligence on the system level. We solicit papers and proposals for panel or group discussions dealing with, but not limited to, the following areas:

- Paradigms and Algorithmic Support
- Bio-inspired or bio-mimetic, including artificial immune systems, ant swarms, digital pheromones
- Organizational and social paradigms
- Emergent intelligence
- Knowledge-based, ontology, semantic technologies
- Cognitive-based Distributed Systems Applications

- Robot teams, robot-human teams
- Web intelligence
- Smart network security
- Situational awareness in the net centric organization

A key feature of this symposium is “distributed;” both the algorithmic support and the applications must involve distributed elements. Our main interest is in papers that make qualitative distinctions between the power of different architectural and algorithmic paradigms for intelligence. We are especially interested in comparative papers, which attempt to draw qualitative distinctions between the expressive power or the inferential capacity of these different paradigms.

The symposium programming will involve presentations with significant question-and-answer time, panel sessions, and topic-oriented group discussion sessions.

## Submissions

Please e-mail submissions of 3-6 pages (in the AAAI format as PDF) to [mlyell@i-a-i.com](mailto:mlyell@i-a-i.com). Submissions can be position statements, work in progress, or completed work.

## Organizing Committee

Margaret Lyell, Intelligent Automation, Inc.; Elisa Kendall, Sandpiper Software; Walt Truszkowski, NASA Goddard Space Flight Center; Tim Finin, University of Maryland, Baltimore County; Lalana Kagal, Massachusetts Institute of Technology; Jason Li, Intelligent Automation, Inc.

## For More Information

For more information about the symposium see the supplementary symposium web site ([www.i-a-i.com/AAAI\\_Distributed\\_Intelligence\\_Symposium/](http://www.i-a-i.com/AAAI_Distributed_Intelligence_Symposium/)).