


Call for Participation

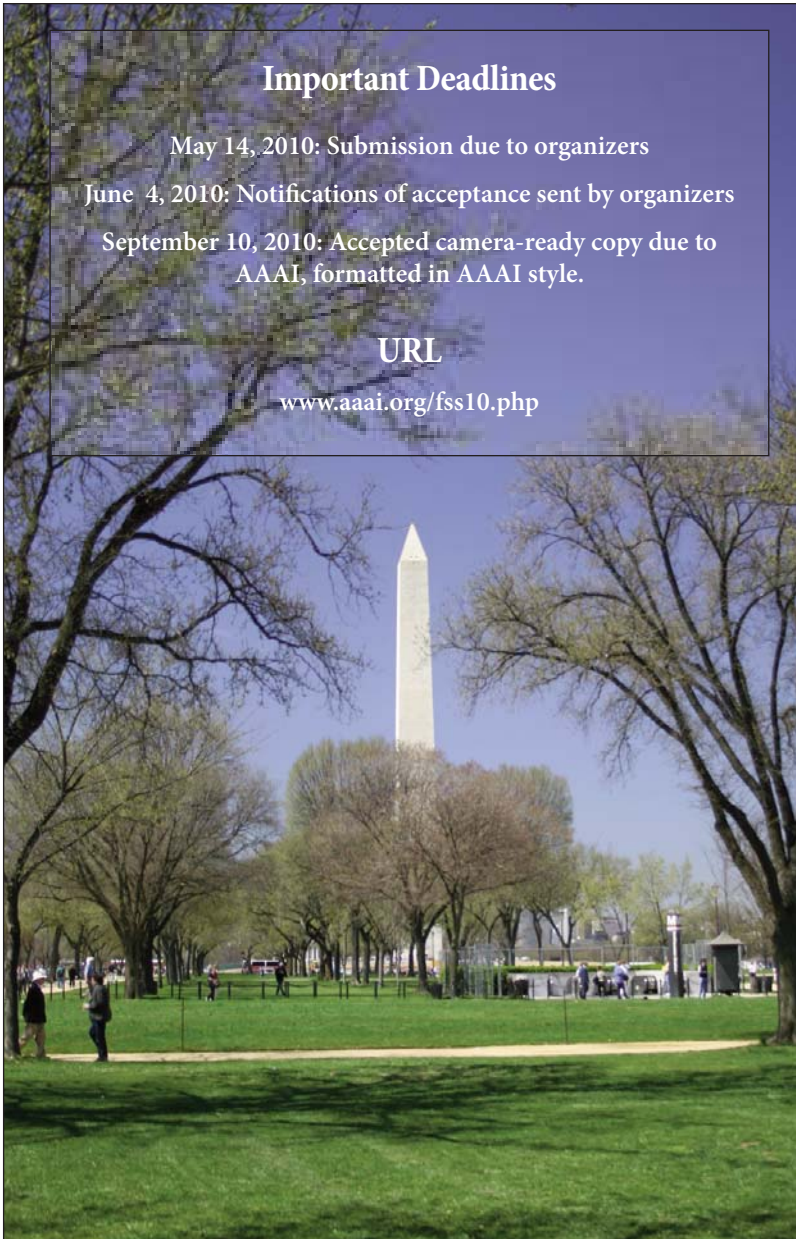
2010 AAAI Fall Symposium Series

November 11–13, 2010  The Westin Arlington Gateway, Arlington, Virginia

Sponsored by the Association for the Advancement of Artificial Intelligence

445 Burgess Drive, Menlo Park, California 94025 

1-650-328-3123  1-650-321-4457 (fax)  www.aaai.org/fss10.php



Important Deadlines

May 14, 2010: Submission due to organizers

June 4, 2010: Notifications of acceptance sent by organizers

September 10, 2010: Accepted camera-ready copy due to AAAI, formatted in AAAI style.

URL

www.aaai.org/fss10.php

- Computational Models of Narrative
- Dialog with Robots
- Manifold Learning and Its Applications
- Proactive Assistant Agents
- Quantum Informatics for Cognitive, Social, and Semantic Processes

An informal reception will be held on Thursday, November 11. A general plenary session, in which the highlights of each symposium will be presented, will be held on Friday, November 12.

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 August 2010.

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)

fss10@aaai.org

www.aaai.org/Symposia/Fall/fss10.php

Submission Requirements

Interested individuals should submit a paper or abstract by the deadline listed in the box. For AAAI formatting guidelines, please see the Author Instructions Pages on the AAAI website (www.aaai.org/Publications/Author/author.php). All papers published by AAAI must follow these instructions without exception. Papers that do not follow the guidelines cannot be published. Please mail your submissions directly to the chair of the individual symposium according to their directions. Do not mail submissions to AAAI.

See the appropriate section in each symposium description for specific submission requirements.

*T*he Association for the Advancement of Artificial Intelligence is pleased to present the 2010 Fall Symposium Series, to be held Thursday through Saturday, November 11–13, at the Westin Arlington Gateway in Arlington, Virginia. The titles of the eight symposia are as follows

- Cognitive and Metacognitive Educational Systems
- Commonsense Knowledge
- Complex Adaptive Systems: Resilience, Robustness, and Evolvability

Cognitive and Metacognitive Educational Systems

This symposium is the second edition of the successful Cognitive and Metacognitive Educational Systems held in at the AAAI 2009 Fall Symposium Series. The 2010 Cognitive and Metacognitive Educational Systems symposium aims to create an intellectual forum for researchers from various interdisciplinary fields to present, discuss, and debate various issues related to metacognitive educational systems (MCESSs). The 2009 symposium focused on various definitions of MCESSs, theoretical and architectural aspects in the design of a new generation of metacognitive tools for enhancing learning, and understanding learning with MCESSs. The symposium raised debate regarding new fundamental questions of paramount importance and that will be the foci at the 2010 symposium:

- What are the theoretical pillars standard CBLEs must adopt to be characterized as MCESSs?
- Is it possible to develop a unified framework for all MCESSs?
- To what extent does the educational system itself have to exhibit metacognitive behavior(s), and how are these behaviors organized to support learning?
- What are the main aspects in metacognition, self-regulation skills, and emotions that influence the learning process?
- What does it mean to be metacognitive, and how can one learn to be metacognitive? Can meta-cognitive skills actually arise from the interaction with MCESSs?
- How can a MCESS be autonomous and increase its knowledge to match the learners' evolving skills and knowledge?
- What about agent-based systems? MCESSs may not be embodied, but does it help if they act as social agents?

Topics

We solicit interdisciplinary contributions in the following topics:

- *Artificial intelligence (AI)*: ontologies, knowledge management, knowledge acquisition, reasoning, intelligent agents
- *Cognitive science*: cognitive architectures, cognitive models applied to the learning domain, metacognition and self-regulated learning (SRL) models and their implementation in learning environments
- *Machine consciousness*: paradigms and sys-

tems for "conscious" educational systems

- *Educational and learning sciences*: metacognitive monitoring and control, contextual constraints, scaffolding SRL processes, agency and goal-driven learning, training and acquisition of SRL skills, tutoring of SRL skills, methodological and analytical techniques for studying learning with MCESSs
- *Computational linguistics*: NLP techniques for assessment, dialogue management, pragmatics and argumentation, conversational and pedagogical agents
- *Computer-human interaction*: adaptive interfaces, information visualization, user profiling and modeling, interaction with embodied MCESS
- *Affective computing*: detection, classification, and interpretation of affect, methodologies and analyses of affect, emotion regulation
- *Computer science and engineering*: software architectures for MCESS, web 2.0 and semantic web technologies, agent-based systems

Submissions

All papers should not exceed 6 pages, should be prepared using the AAAI Author Kit, and should be submitted via e-mail to mces-info@dinfo.unipa.it.

Organizing Committee

Symposium Chairs: Roberto Pirrone (University of Palermo, Italy), Roger Azevedo (McGill University, Canada), Gautam Biswas (Vanderbilt University, USA)

Committee: Philip Winne (Simon Fraser University), James Lester (North Carolina State University), Susanne Lajoie (McGill University), Valerie Shute (Florida State University), Amy Baylor (Florida State University), Cristina Conati (University of British Columbia), Kurt VanLhen (Arizona State University), Vincent Aleven (Carnegie Mellon University)

Supplementary Website

For more information about the symposium see the supplementary symposium web site (chilab.dinfo.unipa.it/mces2010) or write to mces-info@dinfo.unipa.it.

Commonsense Knowledge

When we are confronted with unexpected situations, we fall back on increasingly general knowledge, or analogize to (superficially) far-flung knowledge — but, lacking both, when software applications fail, they often do so in brittle ways akin to human idiots savant. The sheer amount of commonsense knowledge one would need to represent makes it challenging to acquire, to represent, to reason efficiently with, and to harness in applications. But ultimately this is the bottleneck to strong AI, and so it has remained one of the central topics of research interest for 50 years, from McCarthy, Hayes, and colleagues grappling with representation and reasoning, to Lenat, Singh, and Schubert conducting large scale engineering projects to construct collections of background knowledge and special-purpose reasoners to support general inference. Recent advances in text mining, crowdsourcing, and professional knowledge engineering efforts have finally led to commonsense knowledge bases (for example, ResearchCyc) of sufficient breadth and depth for practical applications. A growing number of research projects are now seeking to utilize these knowledge collections in a wide variety of applications — including computer vision, speech processing, robotics, dialogue and text understanding — in real-world tasks such as health-care, finance, and traffic control, where brittleness is unacceptable. At the same time, new application domains are giving fresh insights into desiderata for common sense reasoners and guidance for knowledge collection efforts.



Photo courtesy Arlington Convention and Visitors Bureau

The Commonsense Knowledge Symposium will bring together the diverse elements of this community whose work benefits from or contributes to general inference about the world. The aim is to bring together (1) researchers who focus directly on building systems for acquiring or reasoning with commonsense knowledge, with (2) those who wish to use these resources to help tackle tasks within their industry or within AI itself.

We are looking for papers in areas normally associated with common sense, including but not limited to: large knowledge bases, knowledge acquisition, inference, formal models, and intelligent user interfaces. We are also looking for papers which appeal to a wide variety of researchers beyond those usual areas, including but not limited to story understanding and generation, lexical semantics, ontology, the semantic web, dimensionality reduction, contexts, mental prostheses, and games with a purpose.

We invite submissions for talks, posters, and system demos. During the symposium, we will focus on discussion, panels, tutorials, and demos in addition to talks. We are also planning an experimental session on the last half-day of the symposium, where the workshop will discuss topics TBD based on their timely significance as evinced from the questions and discussions of the previous two days.

Submissions

All papers should be prepared using the AAAI Author Kit, and should be submitted via email to havasi@media.mit.edu. Full papers may be up to 6 pages, short papers may be up to 2 pages, and system demos may be up to 2 pages. Accepted papers (both long and short) from the symposium will be published as an AAAI technical report. These papers should be original material, though we welcome system demos from previously established or published systems. Late breaking ideas are encouraged to submit short papers.

Organizing Committee

Catherine Havasi (MIT Media Laboratory), Doug Lenat (Cycorp, Inc.), Ben Van Durme (Johns Hopkins University)

Supplementary Website

For more information about the symposium see the supplementary symposium web site (csk.media.mit.edu).

Complex Adaptive Systems: Resilience, Robustness, and Evolvability

Companies, societies, markets, and humans rarely stay in a stable, predictable state for long. Yet all these systems are characterized by the notable persistence of some key attributes which maintain their identities, even as their constituent parts change and adapt to new environments. What is it about these systems that define their identity? How do we characterize them? What are the forces that allow a system to persist, even in the face of a radically new environment?

Complex adaptive systems (CAS) and related technologies have proven to be powerful tools for exploring these and other related phenomena. We characterize a general CAS model as having a significant number of self-similar agents that utilize one or more levels of feedback; exhibit emergent properties and self-organization; produce nonlinear dynamic behavior.

Advances in modeling and computing technology, including CAS, have led to a deeper understanding of complex systems in many fields in the natural, physical, and social sciences. These developments have raised the possibility that similar fundamental principles may be at work across these systems, even though the underlying principles may manifest themselves in different ways.

For some practitioners in the field, the terms "resilience" and "robustness" may seem largely redundant. Indeed, there are many other terms from various domains that overlap as well: from "basins of attractions" (physics, mathematics), to "homeostasis" (biology), to "sustainability" (ecology). This is precisely the point: different disciplines often have their own language, even as they are describing identical or similar phenomena. We therefore invite participation from researchers across a wide range of disciplines, in the belief that a deep understanding in one domain may lead to greater insight into others.

Format

Our symposium will have invited talks from leaders in the field, as well as paper presentations on both completed and speculative work. Due to the nature and the novelty of the theme, it is essential to allow ample time for both open-ended and targeted discussions; as such, we will hold panel discussions, round-table talks, and smaller breakout groups to allow for a spirited interaction among participants.

Submissions

Submissions for full papers should be no more than 10 pages, including references. Extended abstract submissions and 1-2 page panel proposals are also welcome. Papers must be formatted in AAAI style.

Organizing and Program Committee

Mirsad Hadzikadic, chair (University of North Carolina, Charlotte), Ted Carmichael, cochair (University of North Carolina, Charlotte), John Hummel (Argonne National Laboratory), Alfred Hübler (University of Illinois, Urbana Champaign), Russ Abbott (California State University), Patrick Grim (SUNY Stony Brook), Bill Rand (University of Maryland), Bob Reynolds (Wayne State University), Tony Beavers (University of Evansville), Molly Rorick (Yale University), Tina Yu (Memorial University of Newfoundland).

Supplementary Website

For more information about this symposium see the supplementary symposium web site (sites.google.com/site/complexadaptivesystems2010).

Computational Models of Narrative

Narratives are ubiquitous. We use them to educate, communicate, convince, explain, and entertain. As far as we know, every society has narratives, which suggests they are deeply rooted and serve an important cognitive function: that narratives do something for us. It is clear that, to fully explain human intelligence, beliefs, and behaviors, we will have to understand and explain narrative.

Despite a revival of interest in the computational understanding of narrative, there is still great uncertainty regarding fundamental questions. What does narrative do for us? What exactly is narrative? What representations are required to model narrative? This symposium will address fundamental topics and questions regarding the computational modeling and scientific understanding of narrative. Immediate technological applications, while not discouraged, are not required. Questions include the following:

- What makes narrative different from a list of events or facts? What is special about the discourse that makes something a narrative, rather than something else?
- What is the relationship between narrative and common sense? Does understanding narrative first require we understand common sense reasoning?
- How are narratives indexed and retrieved? Is there a "universal" scheme for encoding narratives?
- What impact does the purpose, function, and genre of a narrative have on its form and content?
- Are there systematic differences in the formal properties of narratives from different cultures?
- What comprises the set of possible narrative arcs? Is there such a set? Is there a recipe for generating narratives?
- What are the appropriate representations for the computational modeling of narrative? What representations underlie the extraction of narrative schemas from experience?
- How can we evaluate computational models of narrative?

The symposium will bring together researchers with a wide variety of perspectives to share what is known about the fundamentals of the computational modeling of narrative and to explore the forefront of that knowledge. We seek participation from as wide a variety of approaches as possible, including not only AI researchers and technologists, but also psychologists, cognitive scientists, linguists, philosophers, narrative theorists, anthropologists, educators, storytellers, and neuroscientists.

Submissions

Interested parties should send either a full paper (8 pages maximum) or a position paper (2 pages maximum) as a AAAI-style formatted PDF to narrative-fs10@csail.mit.edu. Accepted papers will be published in the proceedings of the symposium, which will be released as a AAAI Symposium technical report. Submission questions should be directed to the organizers at narrative-fs10@csail.mit.edu.

Organizing Committee

Mark Finlayson (Massachusetts Institute of Technology, CSAIL), Pablo Gervás (Universidad Complutense de Madrid), Erik Mueller (IBM), Sriniv Narayanan (ICSI and the University of California at Berkeley), Patrick Winston (Massachusetts Institute of Technology, CSAIL)

Supplementary Website

For more information see the supplementary symposium web site (narrative.csail.mit.edu/fs10).

The 2010 AAAI Fall Symposium on Dialog with Robots will bring together researchers from HRI, spoken dialog systems, intelligent virtual agents, and other related disciplines to identify and discuss the core scientific research challenges of situated, open-world spoken language interaction with robots. Researchers in the human-robot interaction (HRI) community have addressed challenges at the intersection of robotics and cognitive psychology, human factors, and AI. At the same time, concepts and methods for human-computer dialog have been maturing within the spoken dialog community, with the development of fundamental theories, formalisms, and computational models. However, spoken dialog efforts to date have focused almost exclusively on applications within restricted communication contexts, such as telephone- and PC-based information access. This symposium will seek to bridge the historical separation between spoken dialog research and HRI with the goals of sharing ideas and directions, bringing new perspectives on these challenging problems, and catalyzing new research on dialog with robots.

Example relevant topics include, but are not limited to the following:

- *Human-robot dialog and physical context:* multimodal conversational scene analysis; situated language understanding and generation; dialog models for open-world, multi-participant interaction; embodiment and communication affordances

- *Nonverbal human-robot communication:* gaze, gestures, posture, proxemics; cognitive architectures for integrating verbal and non-verbal interaction
- *Social aspects of human-robot dialog:* models of affect and emotion; building engagement, rapport and trust
- *Integration of communication and action in human-robot interaction:* behavior-, intention-, and plan-recognition; spoken output and action planning
- *Adaptation and learning in human-robot dialog:* (life-long) learning and personalization; learning through interaction and by demonstration

Submissions

We invite contributions from researchers and practitioners in HRI, dialog, intelligent virtual agents, as well as related fields, in the form of full papers (6 pages), extended abstracts (2 pages), or demonstration videos accompanied by a demonstration abstract (2 pages). Participants will also be invited to fill in a 1-page position paper including a brief author bio, a description of research interests, and a discussion of one or more research challenge(s) at the intersection of dialog and robotics. All papers should be prepared using the AAAI Author Kit. Please send submissions in PDF format (or any related inquiries) to Dan Bohus at dbohus@microsoft.com.

Organizing Committee

Dan Bohus (Microsoft Research), Eric Horvitz (Microsoft Research), Takayuki Kanda (ATR), Bilge Mutlu (University of Wisconsin-Madison), Antoine Raux (Honda Research Institute)

Supplementary Website

For more information, please see the supplementary symposium website (www.cs.wisc.edu/hci/aaai10).

Manifold Learning and Its Applications



Researchers and practitioners in many fields such as machine learning, computer vision, bioinformatics and robotics are increasingly faced with problems that require understanding and learning from high dimensional data. In such problems, manifold learning and related methods provide a compelling suite of techniques that can exploit local structure in data to learn better models, learn better input-output relationships and reduce the computational complexity of learning.

The goal of the symposium is to promote and discuss research developments in manifold learning, research on related approaches and applications to novel problems. Topics of interest include the following:

- *Theory and analysis of manifold based approaches*: Theoretical limitations of current algorithms; dimensionality estimation; novel similarity or distance metrics; harmonic analysis; topological approaches; parameterizations and embeddings; lie groups and other geometric structures
- *Related approaches*: compressive sensing; graph based methods; Bayesian models and other statistical techniques
- *Applications of manifold learning and related approaches*: Novel problems in AI, bioinformatics, computer vision, NLP, robotics, social network analysis; applicability and scalability of manifold learning algorithms to real world problems

Submissions

We invite submissions for original papers that introduce new research developments, directions, frameworks, results, etc. in these and related areas. Potential participants may submit full papers (up to 8 pages in length in AAAI format) or short papers (extended abstracts, 1–2 pages in length) by May 14, 2010 sent electronically via the online submission site (cmt.research.microsoft.com/AAAI_FSS10_ML/Default.aspx).

Organizing Committee

Richard G. Baraniuk (Rice University), Lawrence Carin (Duke University), Ronald Coifman (Yale University), Robert Ghrist (University of Pennsylvania), Michael I. Jordan (University of California, Berkeley), Tamara G. Kolda (Sandia National Laboratories), Oluwasanmi Koyejo (University of Texas at Austin), Neil Lawrence (University of Manchester), Gilad Lerman (University of Minnesota), Francois Meyer (University of Colorado at Boulder), Robert Pless (Washington University), Guillermo Sapiro (University of Minnesota), Fei Sha (University of Southern California), Vikas Sindhwani (IBM T.J. Watson Research Center), Richard Souvenir (University of North Carolina at Charlotte), Rene Vidal (Johns Hopkins University).

Supplementary Website

For more information about the symposium see the supplementary symposium web site (odin.uncc.edu/aaai-manifold).

The general aim of the Proactive Assistant Agents symposium is to be a venue for the debate and exchange of ideas on the challenges of creating agents that help human users to operate in complex dynamic environments where they face challenges due to cognitive overload in planning and replanning. In these circumstances, users must perform multiple concurrent tasks including: collecting coherent information about the current situation, reasoning about constraints and policies, and dealing with uncertainty to achieve timely decision making. People have limitations in the amount of information that can be meaningfully processed at the same time; consequently, the agent must make sure that the amount of help provided is compatible with the user's ability to cope with it. In order to help the users to cope with cognitive overload in such an environment, proactive agents can offer context-sensitive assistance by: anticipating the users' needs; autonomously planning assistive actions; and offering assistance in an appropriate format at a right time.

Topics

Areas of interest include, but are not limited to the following:

- Plan and goal recognition
- User modeling
- Information gathering and filtering
- Information adaptation and presentation
- Cognitive load assessment
- Applications of information assistants
- Proactive assistance for human teams

The symposium will consist of a mixture of presentations and discussions, with a focus on the direct discussion of specific topics motivated by the presented papers. Authors of accepted papers will give a short 10-minute presentation followed by vigorous discussions in smaller groups.

Submissions

We invite the submission of high-quality papers through EasyChair as linked in the symposium website. Submissions must be in PDF format with a 6-page limit in AAAI style. Please see the AAAI author instructions page for an author kit.

Organizing Committee

Felipe Meneguzzi (Carnegie Mellon University, USA), Jean Oh (Carnegie Mellon University, USA), Martin Kollingbaum (University of Aberdeen, UK), Gita Reese Sukthankar (University of Central Florida, USA), Katia Sycara (Carnegie Mellon University, USA), Neil Yorke-Smith (American University of Beirut, Lebanon)

Program Committee

Marcelo Armentano (UNICEN, Argentina), Amedeo Cesta (National Research Council of Italy, Italy), Yolanda Gil (University of Southern California, USA), Jihie Kim (University of Southern California, USA), Michael Luck (King's College London, UK), Nir Oren (King's College London, UK), Simon Parsons (City University of New York, USA), Federico Pecora (Årebro University, Sweden), David Pynadath (University of Southern California, USA), Wamberto Vasconcelos (University of Aberdeen, UK)

Supplementary Website

For more information about the symposium see the supplementary symposium web site (www.cs.cmu.edu/paa-2010).



Photo courtesy Arlington Convention and Visitors Bureau

Quantum Informatics for Cognitive, Social, and Semantic Processes

Quantum informatics (QI) is an emerging branch of quantum information science, and has recently been applied to challenging computational and modeling problems in artificial intelligence. While the application areas addressed typically operate at a macroscopic scale and could not be considered quantum in a quantum mechanical sense, they may share many key properties with quantum systems including the following:

- Nonmeasurability
- Nondeterminism
- Collapse
- Nonseparability
- Contextuality
- Use of symbolic calculus
- Harmonic oscillations

This symposium will bring together researchers interested in how QI interfaces with or can be applied directly to solve problems with AI in non-quantum domains more efficiently or to address previously unsolved problems with AI in these other fields. The connection to AI should be clearly specified.

Papers should also specify the relevance to AI by addressing one or more of the following broad content areas:

- Semantic representation and processing
- Cognition and brain (memory, cognitive processes, neural networks, consciousness)
- Logic, planning, agents and multiagent systems
- Information processing and retrieval
- Decision theory (political, psychological, cultural, organizational, social, and so on)
- Biological or complex systems
- Social interaction
- Finance, economics, and social structures (for example, organizations, institutions, cultures)
- Other

Papers that address the application of the following QI topics to modeling cognitive, social, and semantic processes for AI will be considered favorably:

- Vector methods (beyond just proximity)
- Entanglement (that is, nonseparability arising from product structures)

- Projection and noncommutativity
- Operators as predicates
- Quantization: How do we get from (apparently) continuous stimuli to clearly discrete expressions? How does collapse happen? How does the future (a range of potentialities) become the past (one outcome has been selected and cannot be changed)?
- Nonclassical probabilistic models
- Normalization and expectation
- Prediction

Submissions

Potential participants are invited to submit either a full paper (up to eight pages), or a position paper (up to four pages). Papers should be submitted through EasyChair (www.easychair.org/account/signin.cgi?conf=qi2010). Each submission will be judged by at least two referees on technical merit and its potential to provoke active discussions. Authors are required to use the latest AAAI template for preparation of all submissions, including papers and abstracts.

Organizing Committee

Peter Bruza (Queensland University of Technology, Australia; p.bruza@qut.edu.au), William Lawless (Paine College; wlawless@paine.edu), C.J. van Rijsbergen (University of Glasgow; keith@dcs.gla.ac.uk), Donald Sofge (Naval Research Laboratory; donald.sofge@nrl.navy.mil), Dominic Widdows (Google; widdows@google.com).

Supplementary Website

For more information about the symposium see the supplementary symposium web site (<http://sites.google.com/site/qiscience>).