

Reports of the AAAI 2008 Spring Symposia

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■ The Association for the Advancement of Artificial Intelligence (AAAI) was pleased to present the AAAI 2008 Spring Symposium Series, held Wednesday through Friday, March 26–28, 2008, at Stanford University, California. The eight symposia were titled (1) AI Meets Business Rules and Process Management, (2) Architectures for Intelligent Theory-Based Agents, (3) Creative Intelligent Systems, (4) Emotion, Personality, and Social Behavior, (5) Semantic Scientific Knowledge Integration, (6) Social Information Processing, (7) Symbiotic Relationships between Semantic Web and Knowledge Engineering, (8) Using AI to Motivate Greater Participation in Computer Science.

The goal of the AI Meets Business Rules and Process Management AAAI symposium was to investigate the various approaches and standards to represent business rules, business process management, and the semantic web with respect to expressiveness and reasoning capabilities. The focus of the Architectures for Intelligent Theory-Based Agents AAAI symposium was the definition of architectures for intelligent theory-based agents, comprising languages, knowledge representation methodologies, reasoning algorithms, and control loops. The Creative Intelligent Systems symposium included five major discussion sessions and a general poster session (in which all contributing papers were presented). The purpose of this symposium was to explore the synergies between creative cognition and intelligent sys-

tems. The goal of the Emotion, Personality, and Social Behavior symposium was to examine fundamental issues in affect and personality in both biological and artificial agents, focusing on the roles of these factors in mediating social behavior. The Semantic Scientific Knowledge Integration symposium brought together the semantic technologies community with the scientific information technology community in an effort to build the general semantic science information community. The Social Information Processing symposium's goal was to investigate computational and analytic approaches that will enable users to harness the efforts of large numbers of other users to solve a variety of information processing problems, from discovering high-quality content to managing common resources. The goal of the Symbiotic Relationships between the Semantic Web and Software Engineering symposium was to explore how the lessons learned by the knowledge-engineering community over the past three decades could be applied to the bold research agenda of current workers in semantic web technologies. The purpose of the Using AI to Motivate Greater Participation in Computer Science symposium was to identify ways that topics in AI may be used to motivate greater student participation in computer science by highlighting fun, engaging, and intellectually challenging developments in the AI-related curriculum at a number of educational levels. Technical reports of the symposia were published by AAAI Press.

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- Architectures for Intelligent Theory-Based Agents
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- Semantic Scientific Knowledge Integration
- Social Information Processing
- Symbiotic Relationships between Semantic Web and Knowledge Engineering
- Using AI to Motivate Greater Participation in Computer Science

AI Meets Business Rules and Process Management

Knowledge representation in general and rule-based representations in particular are core areas of AI. Research results in these areas strongly influenced standards for the web, for example, the Rule Markup Language (RuleML)



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In cooperation with the Association for the Advancement of Artificial Intelligence

or the World Wide Web Consortium (W3C) semantic web standards Web Ontology Language (OWL) and the Semantic Web Rule Language (SWRL). Business rules and business process management have been very active research and applications areas for some years now. Reference models and standards for business process definition and execution have been put forward by organizations like Workflow Management Coalition (WfMC) and Object Management Group (OMG) making use of model-driven knowledge representations. In the last few years, the potential of knowledge representations with precise semantics has been recognized. There is increasing research interest in combining business processes and business rules with semantic technologies. For example, OMG is bringing semantics into business rules with semantics of business vocabulary and business rules (SBVR) and also developed the production-rule representation standard PRR.

This symposium brought together researchers from the different commu-

nities. A major theme of papers was the combination of business process with semantics. Most of the approaches for semantic business process management relied on the W3C standards OWL and SWRL. Only a few papers dealt with the more application-oriented SBVR standard.

The AI Meets Business Rules and Process Management symposium was structured into presentation sessions and breakout sessions. At the presentation sessions a commentator was assigned to comment on the presentations and thus force controversial discussions.

In the two breakout sessions, two main topics were discussed: application requirements and the semantics of business rule and process models. One point of discussion was how the three levels of business processes (workflow instances, process models, metamodels) can be mapped to two levels by distinguishing concepts and instances. Here no final solution was found, although it seemed appropriate to represent the process models and

metamodels on the conceptual level and keep the instance level to the executed workflow instances. Another topic discussed in depth was the missing multilevel view of domain-specific ontologies. As a major drawback the single use of ontologies has been identified. Although intended for reuse, ontologies as they are modeled to meet a certain business requirement are hard to reuse. Today no methods to solve the problem are at hand.

When comparing the standards of W3C and OMG, it became obvious that SBVR defines a standard on the business level while RDF, OWL, and SWRL are more technical. While SBVR combines structural and relational rules and allows specification of a broad spectrum of semantics (for example, open and closed world, modalities, and so on), the restricted expressiveness of the W3C standards to standard logic was criticized repeatedly. In addition, many findings of AI knowledge representation, such as nonmonotonic reasoning, modal logic, or fuzziness, are not considered in

these standards but could improve their use in business applications.

Another topic intensely discussed was the complexity of all of these standards: how can business people be enabled to model their business using these standards? Easy-to-use editors for business rules and business processes modeling based on and enforcing the standards are needed.

Knut Hinkelmann and Barbara Thönissen served as cochairs of this symposium. The papers of the symposium were published as AAAI Press Technical Report SS-08-01.

Architectures for Intelligent Theory-Based Agents

In the past years, a number of reasonably rigorous architectures have been designed, but not implemented, that allow one to prove important properties about agents and their behaviors. In addition, other reasonably rigorous architectures have been implemented without providing attendant proofs about their agents. Unfortunately, there has not been much interaction among the groups working on these two classes of architectures. The lack of communication contributes to slowing the development of an otherwise interesting and potentially very important area. This symposium brought together researchers from these two groups in order to promote interaction and stimulate the investigation of the relationships among the different approaches.

One major theme in the papers presented at the symposium was the description of architectures that focused on strong theoretical foundations and sophisticated forms of reasoning. In these architectures, a model of the environment is used, at run time, to reason about the interaction between the agent and the environment. The agents built using these architectures are capable of sophisticated behavior: they can plan their future actions, communicate intelligently with other agents and entities, diagnose malfunctioning systems, and use learning to improve the model of the environment. These agents can also deal intelligently with unexpected circum-

stances that develop during the agent's interaction with the environment.

Another major theme at the symposium was that of agent architectures oriented toward real-time performance. Here, rigorous development and theoretical work allow researchers to take high-level specifications of the environment and of the desired agent behavior and synthesize lower-level agent controls implementing the desired behavior. Thanks to the rigorous foundations of these approaches, the resulting agents are guaranteed to respond to changes in the environment in real time, and can be proven to avoid undesired states no matter how the environment evolves.

Remarkably, many of the architectures presented at the symposium have been tested successfully on actual industrial applications that range from service grids to space exploration and to autonomous navigation and reconnaissance. All of the talks were followed by very active question-and-answer sessions, where the attendees had the opportunity to exchange ideas and compare their respective approaches.

Marcello Balduccini (Eastman Kodak Company) and Chitta Baral (Arizona State University) served as cochairs of this symposium. The papers of the symposium were published as AAAI Press Technical Report SS-08-02.

Creative Intelligent Systems

Although it seems clear that creativity plays an important role in developing intelligent systems, it is less clear how to model, simulate, or evaluate creativity in such systems. In other words, it is often easier to recognize the presence and effect of creativity than to describe or prescribe it. The purpose of this symposium was to explore the synergies between creative cognition and intelligent systems in a cross-disciplinary setting that fosters cooperation both in designing creative systems and in creatively designing systems. To facilitate this exploration, the symposium was focused around three main goals: artificial systems

that are autonomously creative, systems that augment or enhance human creativity, and computational models for understanding creativity.

The focus of the submissions to the symposium varied widely, and the selection criteria were based on the submissions' relevance to the goals of the symposium. The contributions of the selected papers and the discussion topics led to the emergence of four major themes: computational creativity, simulating creativity as a social process, creativity and computational linguistics, and computational environments for creativity.

The first theme centered on defining various axes for describing or assessing computational creativity. Assessing the value of a creative work may be as objective as validating the steps of a mathematical proof or as subjective as deciding on personal preference for a piece of art. The "product" of a creative system might be a tangible artifact like a proof, a design, or a work of art, or it might instead be a creative process or behavior. The creative value of that product might be rather obvious to the receiver, but it is also often the case that the value of the product must be marketed by its creator. Thus, the act or quality of creativity may not be independent from the promotion of that act or quality, and this raises the issue of whether there exists a difference between creativity and the perception of creativity.

The second theme was characterized by a view of creativity as a social process. Various methods to employ web 2.0 resources in (collaborative) creative projects are being explored, and the simulation of creative processes within multiagent communities allows us to ask questions about macroscale creative phenomena. One aspect of this socialization of creativity that raised some concern among participants was the potential for creativity to be judged as a popularity contest, and there was some discussion about how this can be avoided. Of course, there are many avenues for multidisciplinary enquiry along these lines, and collaborations with the cognitive and social sciences should be explored.

A third theme focused on frame-

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(4) To build systems that can recognize, enhance, or inspire human creativity, possibly in a collaborative manner. (5) To design a methodology or database of test cases against which researchers in computational creativity can evaluate their models. (6) To design models of creativity that help us to understand human creativity.

Dan Ventura, Mary Lou Maher, and Simon Colton served as cochairs of this symposium and the papers of the symposium were published as AAAI Press Technical Report SS-08-03.

Emotion, Personality, and Social Behavior

This symposium brought together researchers from a variety of disciplines to examine fundamental issues in modeling affect and personality in artificial agents, with a particular focus on the role of these factors in mediating social behavior. The symposium attracted 45 participants from institutions spanning eight different countries, and a wide variety of disciplines, including artificial intelligence, neuroscience, both experimental and clinical psychology, social work, industrial design, robotics, the visual arts, music, and theater. The program consisted of 21 technical papers, two invited panels, and an open discussion section.

As would be expected from an AAAI symposium, most papers concerned bread and butter AI and modeling issues, including the role of emotion in cognitive and agent architectures and learning, the relevance of emotion to robotics, the impact of emotion on group decision making, and the specific computational tasks required to implement affective models. Another common topic concerned the role of emotion and personality modeling in art and entertainment applications, such as musical performance or storytelling. The themes of trust and engagement were also explored within the context of embodied robotic characters, both their development and their necessity for successful human-robot interaction.

A number of papers also addressed issues in the expressions of emotion and the response of users to such displays. Several papers focused on mod-

works for creativity in language. For a generator of creative language, it is critical to model the (language) receiver. For example, to produce effective narrative, it is important to consider the reader as a problem solver, constructing the narrative in such a way that the solution at which the reader arrives is the intended one. Metaphor continues to be a major subject of study (both in language-centered creativity and in more general creative settings), and the representation and rerepresentation of knowledge is key both to producing and to understanding metaphors. Here again is a topic for multidisciplinary investigation that can leverage advances in computational linguistics and natural language processing and understanding for modeling language (development and evolution) in creative processes and cultures.

The fourth theme addressed environments for creativity and the difficult problem of assessing creativity in humans. The main points of discussion focused on the idea that computers can help us to be more creative, including through the use of

augmentations that can produce creative products that are not available to unassisted humans. Indeed, it follows that it may be possible to build systems that enhance creativity in anyone rather than focus on creativity aids for creative professionals such as artist and dancers. Computational environments can provide new, faster, and enabling techniques and unique access to collaborators (both human and computational), leading us to consider hybrid creative systems as analogous to the idea of cloud computing.

We concluded with a discussion of possible grand challenges for the next five years (or so) and produced the following list of high-level goals: (1) To build creative systems that are accepted in appropriate human forums as creative agents in their own right. (2) To build a system that can restructure problems or rerepresent knowledge so that the product or behavior of the system is creative across a range of domains. (3) To build systems that can recognize their own emergent creativity, aesthetic preferences, and so on and communicate these to humans.

eling personality and social factors (such as politeness) in speech and natural language generation, some within the context of embodied conversational agents (ECAs). Robot affect believability was explored in mixed human-robot contexts by examining the effects of the robot's "stress level" on human task performance. One study reported on the use of teleoperated androids as stand-ins for specific individuals. Increasingly, emphasis was on evaluating the model effectiveness through empirical studies.

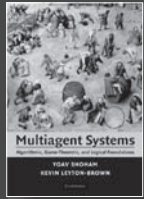
One of the major new themes of the symposium was the role of AI systems and models in psychotherapeutic contexts. Several papers addressed the issue of assistive agents in psychotherapy. Clinicians highlighted specific needs in clinical practice that could be addressed by synthetic agents, virtual reality, and more established AI technologies, such as expert systems. Speakers addressed questions such as what features were necessary for an effective agent-client interaction, diagnostic categories that may benefit from agent-augmented therapy, and ethical and pragmatic issues associated with the introduction of synthetic agents into the client-therapist relationship. Examples of ongoing work included the development of virtual humans as stand-ins for patients with specific characteristics or syndromes, to be used in clinical training, and a gamelike system to teach children how to cope with bullying behaviors. However, there was consensus that synthetic agents would act as aids to human clinicians, not as their replacements.

This symposium follows several earlier symposia focusing on affective computing, emotion modeling, and social agents. The organizing committee would like to thank the authors and other participants for helping make the symposium such a success. Special thanks also go to the program committee members: Antonio Camurri, Gerry Matthews, Andrew Ortony, Ana Paiva, Rui Prada, Helmut Prendinger, and Fiorella de Rosis, as well as to the AAAI staff. Ian Horswill, Eva Hudlicka, Christine Lisetti, and Juan Velasquez served as the organizers of the symposium. The papers were

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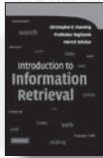
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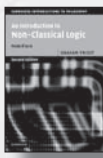


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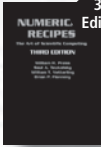


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Semantic Scientific Knowledge Integration

E-science is a growing subject of discussion and research, covering topics such as grid computing for science and knowledge-enhanced scientific data retrieval. Within various sciences we are experiencing the emergence of virtual observatories such as those in astronomy, heliophysics, geophysics, and solar-terrestrial physics, where virtual distributed collections of scientific

data are made available in a transparent manner. The goal of such efforts is to provide a scientific research environment that provides software tools and interfaces to interoperating data archives. Achieving this goal entails meeting growing requirements for next-generation information technology, architectures, and infrastructure. Similar requirements are emerging in research communities ranging from biomedical informatics and geosciences to deep space exploration. While the initial goal for these efforts may include relatively simple uses of AI techniques, the medium- and long-

range goals for these efforts require full-scale semantic integration of scientific data and related knowledge such as science theories; thus they present interesting motivations for artificial intelligence techniques and provide fertile ground for their testing and evolution.

Concurrent with the growing demand for new computer-based approaches to scientific research is a growth in semantic technologies. While knowledge representation languages and environments continue to evolve, some have reached a stable state in terms of reaching recommendation status from standards bodies. This recommendation status has attracted the interest of startup as well as established companies, and a number of academic and commercial tools and environments are now available for use and are beginning to be deployed by some e-science practitioners.

The workshop brought together researchers from AI and natural science communities to provide an interdisciplinary setting. Topics ranged from foundations to applications of semantic science knowledge integration. Three main trends emerged from submissions and discussions including (1) ontology-enabled data integration, (2) ontology integration, (3) knowledge representation for science. In the latter, we noticed a shift in the use of semantic technologies in scientific activities, from an engineering role, in which ontologies are used as background aids to data integration or workflow operation, to a scientific role, in which ontologies are directly used in the foreground to express the scientific theories and workflows required by various scientific computations. One other trend was the growing interdisciplinary nature of the projects as the majority of the attendees were already working in teams that necessarily spanned scientific and computer science disciplines.

This was the first symposium that the organizers are aware of on the application of semantic integration approaches to e-science. As such, one of the outcomes of the meeting was community building. The organizers of the symposium were Deborah McGuinness, Peter Fox, and Boyan Brodaric.

The papers of the symposium were published as AAAI Press Technical Report SS-08-05.

Social Information Processing

Social information processing refers to a collective human activity through which organized knowledge emerges from the actions of and interactions among large numbers of users. Social information processing is concerned with the question of how to leverage the knowledge and opinions of many users to solve information-processing problems, and it can be thought of as a subfield of social or human computing. Recent interest in social information processing was sparked by the rise of the social web, which enabled large numbers of users to create and share knowledge in novel ways. Social web users generate content, annotate it with descriptive metadata in the form of tags, discussion, and ratings, and create links among users, also called social networks. Examples of social web sites include blogs and collaboration tools, such as wikis, collaborative bookmarking and tagging sites such as del.icio.us and CiteULike, social media sites like YouTube and Flickr, and general social networking sites, such as Facebook.

The symposium gathered researchers from academe and industry who are using the social web as a virtual laboratory to study social information processing. Three main themes emerged over the course of the symposium. The first theme addressed by researchers, including both invited speakers, dealt with the dynamics of collective behavior and how it can be used to answer a variety of questions about the evolution of language and the quality of online content, as well as point to a better design of user interfaces that will elicit more high-quality content from users.

The second major theme was that of the social web as a knowledge generation system in which users express personal knowledge through articles, tags, links, and so on or modify the personal knowledge expressed by others. The talks explored a broad spectrum for the applications of such

knowledge. One set of talks focused on how knowledge created by many users could be used to tailor information to an individual user. Research at the other end of the spectrum examined how knowledge generated by many could be combined to create a common global knowledge base, as exemplified by Wikipedia and its many wiki-based special-interest offshoots, or how it could be used to understand the nature of communities (for example, on Flickr) and the concepts and vocabularies they use.

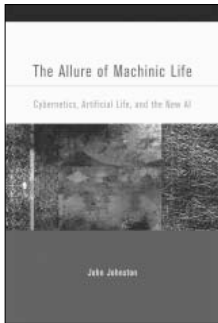
The third major theme was of the social web as a problem-solving system. We learned about several ongoing projects whose aim is to aggregate observations of many individuals to solve a global problem, whether it is to effectively manage common resources, reduce pollution, or help the visually impaired or handicapped individuals navigate in new environments. Finally, presenters explored algorithmic challenges posed by social information processing. These challenges include the sheer volume and heterogeneity of data, its dynamic, interlinked nature, as well as the great diversity of the user population and the many forms of interactions that take place among users.

Kristina Lerman, David Gutelius, Bernardo Huberman, and Srujana Merugu served as cochairs of this symposium. The papers of the symposium were published as AAAI Press Technical Report SS-08-06.

Symbiotic Relationships between Semantic Web and Knowledge Engineering

In the past decade, research in intelligent systems—once contained to standalone applications—has moved to the web. Much of the same research community that once concerned itself with the elicitation of knowledge to develop solitary expert systems now views the entire Internet as its potential knowledge base. With the web comes unparalleled scope and unparalleled chaos. The symposium explored how knowledge-engineering techniques that originated in a non-

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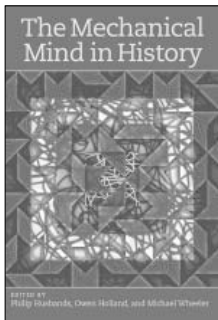


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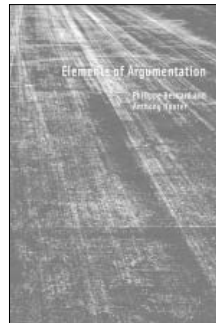


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networked world have translated to this widely distributed environment.

The symposium included 13 submitted papers, two invited talks, and an industrial panel in the closing session. About half of the participants in the symposium were from Europe, a reflection of the strong support that work on the semantic web has received there.

A theme that permeated the workshop concerned approaches to the collaborative development of large knowledge bases. For many of the participants, knowledge engineering for the web means knowledge engineering on the web. Two different groups represented at the symposium (from SRI International and the University of Würzburg) are using wiki-based methods to enable distributed, collaborative knowledge editing. These wikis are augmented with support for capturing relational tables, decision trees, and hierarchies of information. There seemed to be no question that web-based knowledge entry has considerable benefits, especially for relatively

naïve users. The wiki-based tools, however, appeared best suited for entry of taxonomies and were limited in their ability to handle complex knowledge structures. Of course, the ease with which wikis support the relatively simple aspects of knowledge engineering is their primary appeal. The participants of the symposium spent considerable time discussing the precise requirements that wikis seem to fulfill and the gap in the knowledge-engineering process where more conventional tools still are needed.

An attraction of the wiki-based methods is their implicit support for collaborative authoring. The group from Stanford University showed how a new version of the well known Protégé tool will support distributed, collaborative entry of complex ontologies and knowledge bases. This "thick client" approach offers built-in features that may augment ontology metadata with the content of threaded e-mail discussions among developers about specific elements of the ontology, providing a mechanism to en-

code both a trace of the controversies that arose during knowledge engineering and the design rationale for the choices that the developers ultimately made.

The notion of groups of developers or users providing such annotations led to considerable discussion regarding whether these annotations can provide reasonable quality assurance for ontologies on the semantic web. The collaborative Protégé tool allows developers to associate annotations with ontology elements, and the BioPortal ontology repository of the National Center for Biomedical Ontology opens up this capability to arbitrary end users of online knowledge content. The symposium participants contrasted BioPortal's open, distributed style of peer review with proposals for quality assurance by small, centralized editorial boards (such as the OBO Foundry for ontologies in biomedicine). They expressed concerns about whether end users actually would ever be motivated to offer online comments about ontologies the

way users of Amazon.com offer peer review of books. They also expressed concerns about the scalability of centralized quality assurance when performed by small editorial boards.

Aberdeen presented a tool that supports users searching for ontologies with particular concepts and substructures and argued that its approximation techniques allow these searches to be done relatively quickly. Additionally, further tools that support the checking and repairing of lexical and logical inconsistencies in ontologies should enable repositories such as BioPortal to enhance the quality of their ontology content.

Ontology quality requires that ontologies be modular and composable. In his invited talk, Alan Rector from the University of Manchester presented several use cases for ontology modularization and argued that modularization would lead to ontologies that are better structured and more cognitively accessible.

Considerable discussion focused on creating knowledge-based systems from components such as reusable problem-solving methods (PSMs) and knowledge bases (usually instantiated ontologies), all of which, in principle, could be located on the web. These developments are exploiting the flexibility of contemporary ontology management systems (such as Protégé), which allow loose coupling of problem-solving components. Future plans include making knowledge-engineering tools available as web services and incorporating not only conventional PSMs but also a wider range of problem solvers as components of the systems that are created.

Several papers presented at the symposium provided reports on real applications that had been engineered for the semantic web. These submissions addressed domains as diverse as biomedicine, engineering, and cultural heritage.

The last day of the symposium featured an invited talk from Tom Gruber, who argued that the semantic web at last offers end users the opportunity to perform the “gigantic join” that will unify structured and unstructured data, ultimately allowing them to perform tasks on the web, even when

their goals are poorly articulated. Gruber’s talk was followed by a panel of workers from industry, who discussed how their companies were relying on both knowledge-engineering and semantic web technologies in their everyday work.

The symposium allowed the participants to do a reality check on the translation of theoretical work on semantic web languages and technologies into practical applications. Engineering concerns related to the semantic web often are deemphasized at scientific meetings. This AAAI Spring Symposium allowed its participants to address these pragmatic issues head on.

Derek Sleeman and Mark Musen served as cochairs of the symposium. The contributed papers were published as AAAI Technical Report SS-08-07.

Using AI to Motivate Greater Participation in Computer Science

In the past few years, many universities have experienced a dramatic decline in undergraduate computer science enrollments. Although the dot-com bust and job offshoring have often been cited as causes for this decline, there is also mounting evidence that computer science is being equated simply with “programming” and is losing its intellectual excitement to students who are unaware of the wide variety of options in the discipline. In reality, the field of computer science now offers far more options than it did even a decade or two ago. Moreover, many of these diverse options are rooted in AI and are quite exciting to students—examples include robotics, game playing, machine learning, and multidisciplinary work in biocomputation and computational economics.

This symposium brought together educators and researchers to discuss successful strategies in using AI-based educational resources to help increase the intellectual excitement of computer science and promote greater participation in the field. A wide variety of topics were covered, including the use of robotics to engage and inspire students, the incorporation of AI-themed

assignments into introductory computer science courses, as well as outreach programs aimed at precollege level students to introduce them to computing through AI and robotics. A significant theme throughout the symposium was the level of interest and engagement that AI could engender at various levels of the educational pipeline. A diverse set of presentations covered topics including the use of robots by middle school students as a means for creative self-expression, AI-centered programs aimed at helping high school students make the transition to college, as well as a wide variety of introductory and upper-division courses and projects making use of robot programming, game playing, or other AI-themed assignments. Indeed, an invited talk by Illah Nourbakhsh (Carnegie Mellon University) at the outset of the symposium stressed the importance of attracting students to computing at all stages along the educational pipeline (rather than just focus on students at the outset of their college programs).

There were a significant number of papers at the symposium discussing the use of robots in various computer science courses and several early indications showing that use of a tangible medium, such as a robot, helped to increase the interest of students in computing. Deepak Kumar (Bryn Mawr College) presented work being done jointly with Georgia Tech on creating personal robots for use in introductory programming courses. Similarly, Emily Hamner (Carnegie Mellon University), Andrew Williams (Spelman College), and Tom Lauwers (Carnegie Mellon University) presented respective papers showing innovative and creative uses of robots as a way of engaging students in computing while providing them opportunities for creative outlet.

Another theme of the symposium involved ways in which new courses could incorporate AI-related concepts. For example, Eric Breck (Cornell University) provided an overview of several new AI-related courses at Cornell that have helped spur interest in computing among students from a variety of majors. Similarly, Vincent Conitzer (Duke University) gave an invited talk

on teaching computational economics courses as a way to bring economics students into the computing fold, while also giving computer science students a greater appreciation for applications of their work in other fields. In a similar vein, several other papers discussed ways that AI could be used at various stages of the college educational pipeline to motivate and retain students.

The symposium concluded with a session in which several participants provided hands-on demonstrations of projects discussed in their presentations. This gave participants a chance to interact with several robots and take a closer look at various curricular initiatives. During the demo session, the GamesCrafters group from University of California, Berkeley, led by Dan Garcia, had a significant presence and provided symposium attendees the opportunity to play a number of computer games while appreciating the camaraderie, appeal, and motivation that a research and development group on computational game theory can engender.

While it was clear from the symposium that there is a broad variety of ways in which AI could be used to help attract and retain students in computer science, there was also an appreciation for many external factors affecting student interest in the field (primarily the economic outlook in the high-tech sector). Nevertheless, many symposium attendees shared a high level of enthusiasm for the various curricular developments and experiments that were being undertaken in an attempt to reinvigorate the pipeline of students in computing. The development and assessment of these efforts is ongoing, and similarly themed future symposia may provide a venue for continuing to report on the impact of this work.

Mehran Sahami was chair of this symposium. The papers from the symposium were published as AAAI Press Technical Report SS-08-08.

Marcello Balduccini is a research scientist with Eastman Kodak Company.

Chitta Baral is a professor at Arizona State University.

Boyan Brodaric is affiliated with the Geological Survey of Canada.

Simon Colton is a senior lecturer in the



IUI 2009 is the annual meeting of the intelligent interfaces community and serves as the principal international forum for reporting outstanding research and development on intelligent user interfaces. IUI is where the community of people interested in Human-Computer Interaction (HCI) meets the Artificial Intelligence (AI) community. We're also very interested in contributions from related fields, such as psychology, cognitive science, computer graphics and the arts.

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Friday, 1 August 2008

Workshop Proposals Informal Intention to submit
Workshop Proposals submission

Conference Co-Chairs:

Cristina Conati (University of British Columbia, Canada)
Mathias Bauer (mineway GmbH, Germany)

Program Co-Chairs:

Nuria Oliver (Telefonica R&D, Spain)
Dan Weld (University of Washington, USA)

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Department of Computing at Imperial College, London.

Peter Fox is affiliated with National Center for Atmospheric Research.

David Gutelius is a researcher at the Artificial Intelligence Center at SRI International, Menlo Park, CA.

Knut Hinkelmann is a professor at the University of Applied Sciences Northwestern Switzerland.

Ian Horswill is an associate professor of computer science at Northwestern University.

Bernardo Huberman is a senior HP Fellow and director of the Social Computing Lab at Hewlett-Packard Laboratories.

Eva Hudlicka is a principal scientist at Psychometrix Associates.

Kristina Lerman is a project leader at the USC Information Sciences Institute and a research assistant professor at the Computer Science Department, University of Southern California.

Christine Lisetti is an associate professor at the School of Computing and Information Sciences at Florida International University.

Deborah McGuinness is affiliated with Rensselaer Polytechnic Institute.

Mary Lou Maher is a program director in the Information and Intelligent Systems division of the National Science Foundation, on leave from the faculty of Architecture, Design and Planning at the University of Sydney.

Mark A. Musen is a professor of medicine (Biomedical Informatics Research) and of Computer Science at Stanford University.

Mehran Sahami is an associate professor and associate chair for education in the Computer Science Department at Stanford University.

Derek Sleeman is a professor of computing science at the University of Aberdeen (UK).

Barbara Thönsen is a researcher at the University of Applied Sciences Northwestern Switzerland.

Juan Velasquez is a researcher from MIT CSAIL.

Dan Ventura is an associate professor in the Department of Computer Science at Brigham Young University.