

IJCAI-07 Keynote & Invited Speakers

Keynote Speaker

The AI Challenges in Developing Economies

Raj Reddy, *Carnegie Mellon University (USA)*

A grand challenge for AI in developing economies is improving the quality of life of the 4 billion people at the bottom of the pyramid who subsist on less than \$2,000 per year income. One critical component of improving the quality of life is access to information and knowledge that is helpful for education, healthcare, food, and agriculture in rural communities. This talk will review why the world's poor have more to gain in relative terms by the effective use of the IT and AI technology and review the barriers that make it difficult to realize the potential benefits. The challenges are even more acute in a polyglot nation like India with 21 official languages and where nearly 40 percent of the population cannot read or write. It is not enough to overcome basic technical challenges of connectivity divide, and computer access divide — we have to deal with literacy divide and language divide issues also. This talk will discuss the unfinished research agenda of AI problems of spoken language understanding, dialog modeling, multimedia synthesis, and language generation, multilingual indexing and retrieval, language translation, and summarization.

Invited Speakers

Unmanned Aerial Vehicle Research: Challenges and Prospects

Patrick Doherty, *Linköping University (Sweden)*

Due to technological advances and increasing investment, interest in unmanned aerial vehicles (UAVs) as a practical, deployable technological component in many civil applications is rapidly increasing and becoming a reality, as are their capabilities and availability. UAV platforms also offer a unique experimental environment for developing, integrating, and experimenting with many artificial intelligence technologies such as automated planners, knowledge representation systems, chronicle recognition systems, etc. In this talk I will describe some of the work being pursued at Linköping University, Sweden in this area. Focus will be placed on integration of artificial intelligence technologies in such systems in the context of civil and commercial applications. A number of UAV systems developed and deployed by our research group for sophisticated experimental application scenarios will be demonstrated. Challenges and prospects for future UAV systems will also be highlighted as will the theme of this conference, AI and its benefits to society.

The e-Scientist Is the Semantic Web's Friend (or a Friend of a Friend)

Carole Goble, *University of Manchester (UK)*

eScience is scientific investigation performed through distributed global collaborations between scientists and their resources, and the computing infrastructure that enables this. Scientific progress depends on harvesting and harnessing the "collective intelligence" of the scientific community. The Semantic Web is an extension of the current World Wide Web in which information is given well-defined meaning to facilitate sharing and reuse. Intuitively, applying the Semantic Web paradigm to the UK eScience program potentially brings significant benefits to scientific discovery. We have seen this most notably on the Life Sciences. Sufficiently semantically enriched scientific metadata might lead to hypothesis generation and scientific knowledge discovery not just better data search and data webs. However, there are many obstacles to the vision of a Life Science Semantic Web. Drawing on our extensive, practical experiences of a variety of high profile e-Science projects, we have adopted increasingly

“scruffy” approaches, becoming encouraged and disillusioned in equal measure. In particular, when we look at the big picture of scientific practice, not only does a little bit of semantics go a long way, it may be all you need. The “social networking, folksonomy, collaborative tagging and data mash-up” zeitgeist, gathered under the banner of “Web 2.0,” has struck a chord with e-Scientists and Scientists. Initiatives such as Friend-Of-A-Friend (FOAF) become Colleague-of-a-Colleague. Rather than MySpace we have MyExperiment. So, is e-Science the Semantic Web’s friend? Or just a FOAF? Or is e-Science just tagging along?

Human Nature: Art with Robots, Automation, and Networks

Ken Goldberg, *University of California, Berkeley* (USA)

I’m interested in the interactions between nature and technology. I’ll present selected artworks developed with students and other collaborators involving robots and networks over the past 20 years. These include the Telegarden, a robot installation that allowed online participants to remotely tend a living garden; Demonstrate, where an ultra high-resolution video camera raised eyebrows at the 40th anniversary of the Free Speech Movement; and Ballet Mori, a classical dance performed at the San Francisco Opera House to music conducted by live seismic data.

Cyber-Assisting Real World with Ambient Intelligence and Semantic Computing

Hideyuki Nakashima, *Future University* (Japan)

The goal of our Cyber Assist project was to develop human-centered information processing assistance systems (intelligence booster) that could be used without special knowledge or training. We also addressed the problems of information overload and privacy. The research project took three main approaches: (1) Semantic computing, (2) location-based situated communication, and (3) multiagent simulation. I plan to cover them all in the talk. Semantic computing is basically a system to be developed on the Internet. One of the goals is creation of a world-wide document sharing system with annotations so that machines can handle some part of the semantics. Communication method and the content are closely related to each other and thus should not be separately designed. We believe one of the important groundings of content is to its location. By using location as the address to deliver information—in contrast to the global ID such as IP address—the system gets access to the context. This method is also useful in protecting the privacy of the recipient because the user’s ID is not necessarily given to the system. Multiagent simulation was used in an essential way to design societal systems. I will present examples including a city-wide-networked car navigation system, a bus-on-call system, and simulators used for RoboCup rescue. Finally, I will report on systems that we developed for Aichi Expo 2005: (1) location-based information providing and tracking service in the Global House, which is a pavilion run by Japanese government, and (2) artistic installment of sound in open setting of Japanese garden as a part of Laurie Anderson’s “Show and Walk” installment.

Intelligent Assistive Technology: The Present and the Future

Martha E. Pollack, *University of Michigan* (USA)

Recent advances in two areas of computer science—wireless sensor networks and AI inference strategies—have made it possible to envision a wide range of technologies that can improve the lives of people with physical, cognitive, and/or psycho-social impairments. Indeed, some of these same “assistive technologies” can also be a boon for people without impairments. This talk will describe a variety of projects that are developing intelligent assistive technology and will consider future design challenges and opportunities.

Events, Patterns and Analysis: Forecasting Conflict in the 21st Century

Devika Subramanian, *Rice University* (USA)

Armed conflict between countries remains a constant feature of today’s world. Is it possible to forecast international conflict by tracking and analyzing news stories and media reports on interactions between countries? I will describe ARES, a system that provides early warning of the onset of serious international conflict. ARES parses online media sources to extract events from text, and uses novel methods to analyze these events. I will present the results from using ARES to predict conflicts in the Middle East over the last two decades. This is joint work with political science professor Richard Stoll at Rice University, and is supported by an NSF ITR grant.