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**Discovery Informatics Symposium:
The Role of AI Research in Innovating Scientific Processes**

November 2-4, 2012

Arlington, VA

Association for the Advancement of Artificial Intelligence
Fall Symposium Series

Invited Speakers



Timothy W. Clark, Harvard University
“Pervasive Semantic Annotation of Biomedical
Literature using Domeo”

William Cohen, Carnegie Mellon University
“Reasoning with Data Extracted from the Scientific
Literature”



Lawrence Hunter, University of Colorado
“The First Artificial Mind Will Think About
Molecular Biomedicine”

Chris Lintott, University of Oxford
“Efficient Crowdsourcing: How to Do Science with
600,000 Participants”



Hod Lipson, Cornell University
“The Robotic Scientist: Distilling Natural Laws from
Experimental Data, from Particle Physics to
Computational Biology”



Jude Shavlik, University of Wisconsin Madison
“Human-in-the-Loop Machine Learning”

Invited Panels

“Challenges in Big Data: Discoveries at the Fringe of Science”

Invited panelists:

Lise Getoor, University of Maryland
Haym Hirsh, Rutgers University
Vasant Honavar, National Science Foundation
Steven Salzberg, Johns Hopkins University

“Discovery Informatics: Innovating Science Practice One Scientist at a Time”

Invited panelists:

Melissa Cragin, University of Illinois at Urbana Champaign
Christopher Erdmann, Harvard Smithsonian Center for Astrophysics
Yolanda Gil, University of Southern California
Barbara Ransom, National Science Foundation

Symposium Overview

Addressing the ambitious research agendas put forward by many scientific disciplines requires meeting a multitude of challenges in intelligent systems, information sciences, and human-computer interaction. There are many aspects of the scientific discovery process that our community could help automate, facilitate, or make more efficient through artificial intelligence techniques. For example, although considerable efforts have been directed toward data modeling and integration, these activities continue to demand large investments of scientists' time and effort. The scientific literature continues to grow and is becoming more and more unmanageable for researchers operating in the most active disciplines. Better interfaces for collaboration, visualization, and understanding would significantly improve scientific practice. Scientific data, publications, and tools could be published in open formats with appropriate semantic descriptions and metadata annotations to improve sharing and dissemination. Opportunities for broader participation in well-defined scientific tasks enable human contributors to provide large amounts of data, annotations, or complex processing results that could not otherwise be obtained. These are just some examples of areas where there are opportunities for artificial intelligent techniques could make a difference. Improvements and innovations across the spectrum of scientific processes and activities will have a profound impact on the rate of scientific discoveries.

Organizers

Will Bridewell, Stanford University; Yolanda Gil, University of Southern California; Haym Hirsh, Rutgers University; Kerstin Kleese van Dam, Pacific Northwest National Laboratory; Karsten Steinhaeuser, University of Minnesota.

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