

Kolloquium Angewandte Informatik

Discovery Informatics: Intelligent Systems to Accelerate Data Analysis in Science and Beyond

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Although recent advances in computing have resulted in a data-centered revolution in science practice, I believe it will be dwarfed by what is ahead. While orders of magnitude improvements in network bandwidth, computing, and distributed sensing are pushing the envelope in the scale of the scientific phenomena that can be studied, the human component of science has been largely unaddressed and is increasingly becoming a bottleneck to progress. Scientists still largely drive scientific processes but it is increasingly challenging to manage the scale and complexity of modern discovery processes. This has created great opportunities for artificial intelligence to make scientific processes more efficient and to break new barriers in the complexity of the problems that can be tackled. In this talk, I will describe our current research on intelligent workflow systems that provide assistance and automation for complex data analysis processes. I will illustrate new capabilities that are enabled by coupling semantic representations of processes and data. I will describe our work on semantic workflow systems to assist scientists to create valid workflows, and to automate workflow generation given high-level user guidance. Semantic workflows are an example of provenance-aware infrastructure for science, where metadata is used and generated as the data is being processed. I will discuss our new work on organic data science, where communities of scientists can describe data analysis processes explicitly as a platform for collaboration. I will also introduce the nascent discipline of Discovery Informatics that is catalyzing relevant research in artificial intelligence, visualization, data analytics, and social computing with the goal of improving and innovating science processes to accelerate discoveries.

SPEAKER BIO:

Dr. Yolanda Gil is Director of Knowledge Technologies and Associate Division Director at the Information Sciences Institute of the University of Southern California, and Research Professor in the Computer Science Department. She received her M.S. and Ph. D. degrees in Computer Science from Carnegie Mellon University. Her research interests include intelligent user interfaces, knowledge-rich problem solving, and social knowledge collection. Her most recent work focuses on intelligent workflow systems to support collaborative data analytics at scale. She recently led the W3C Provenance Group that charted a community standardization effort in this area. Dr. Gil has served in the Advisory Committee of the Computer Science and Engineering Directorate of the US National Science Foundation. She is Chair of ACM SIGART, the Association for Computing Machinery's Special Interest Group on Artificial Intelligence. She was elected Fellow of the American Association of Artificial Intelligence (AAAI) in 2012.

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(Hinweise für Besucher: www.aifb.uni-karlsruhe.de/Allgemeines/Besucher)

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Zu diesem Vortrag lädt das Institut für Angewandte Informatik und Formale Beschreibungsverfahren alle Interessierten herzlich ein.

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