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RESEARCH INTERESTS

Current interests include meta reasoning framework for learning, semantic approaches to workflow systems, interactive knowledge acquisition, and educational data mining. I am working on 1) a meta controller for coordinating behavior of multiple machine learning systems, 2) interactive tools for generating workflows for execution on the grid infrastructure, and 3) intelligent capabilities for distance education, including answering student queries and scaffolding collaborative problem solving activities in online discussions.

EDUCATION

- Ph.D.** **Computer Science, University of Southern California, CA.**
Thesis: Bounding the Cost of Learned Rules: A Transformational Approach
Advisor : Prof. Paul S. Rosenbloom (USC/ISI)
- M.S.** **Computer Science and Statistics, Seoul National University, Seoul, Korea.**
Thesis : Building Interface for Accessing Database Management System
or Expert System Shell
- B.S.** **Computer Science and Statistics, Seoul National University, Seoul, Korea.**
(Cum Laude)

EXPERIENCE

Research

Research Scientist for the Interactive Knowledge Capture project, 5/99 - present
Intelligent Systems Division, USC/Information Sciences Institute,

- PedDiscourse (Pedagogical Discourse Analysis). Assessing student activities in threaded on-line discussions and providing answers to student queries. (<http://www.isi.edu/~carte/den>)
- Maven (Learning Problem Solver). A meta controller for coordinating learning activities by multiple learners. (<http://www.isi.edu/ikcap/maven>)
- JIST (Just-In-caSe just-in-Time Intelligence Analysis). An interactive web-based interface for argumentation and decision-making. (<http://www.isi.edu/ikcap/jist>)
- CAT (Composition Analysis Tool) and WINGS. CAT facilitates interactive construction of workflows (computation pathways) where users select and connect existing workflow components, and the system interactively generates assistance in completing a correctly formulated pathway. (<http://www.isi.edu/ikcap/scec/CAT/>)
- ECHO (mEta-Cognitive History analysis and Organization). Developing memory-based meta-level reasoning tool for interactive knowledge capture. It estimates the confidence level of learned knowledge using past problem solving episodes and provides suggestions to improve the knowledge and make the problem solving more successful. (<http://www.isi.edu/ikcap/echo/>)

- SLICK (Skills for Learning to Interactively Capture Knowledge). Developing acquisition interfaces that are proactive learners, able to reason about learning activities and with initiative in participating in the process accordingly. (<http://www.isi.edu/ikcap/slick/>)
- KANAL (Knowledge ANALysis). A Tool for checking process models entered by users. By relating different pieces of information in process models among themselves and to the existing KB, it performs a variety of verification and validation checks and propose useful fixes. (<http://www.isi.edu/ikcap/kanal/>)
- EMeD(Expect Method Developer). A tool to guide knowledge base creation based on interdependency analysis. (<http://www.isi.edu/~jihie/EMeD/emed.html>)
- Developing KA (knowledge Acquisition) Evaluation Methodology.
- Developing Teaching Aids for Distance Education: As web-enhanced courses become more successful, they put considerable burdens on instructors and teaching assistants. We present our work on developing software tools to support instructors by A) semi automatic grading of discussions and B) creating instructional tools that handle many student requests. We are using knowledge-based techniques in modelling course components, student queries, and relations between them..

Research Scientist for the Active Catalogs project ,11/96 - 5/99

Distributed Scalable Systems Division, USC/Information Sciences Institute,

Building ontologies for components and component properties in electro-mechanical design domain. The ontologies, including product taxonomies, application ontology and function ontology, can support different search capabilities, including mechanisms for mapping and combining different types of requirement to create database queries. Generating database search interface based on product properties and integrating the Active Catalog search system with the product model generation and simulation.

Research Assistant, member of the Soar group 1/93 - 11-96.

Intelligent Systems Division USC/Information Sciences Institute,

Investigating the sources of expensiveness in speed-up learning through a transformational analysis of the learning process, and eliminating the sources based on the analysis (<http://www.isi.edu/soar/soar-homepage.html>).

Researcher for the YODA Robot Project 1/96 - 12/96

Intelligent Systems Division, USC/Information Sciences Institute

Responsible for navigation planning and designing/testing robot behaviors for the task of office navigation and meeting arrangement.

Research Assistant, AI lab 3/88 - 12/89.

Computers Science and Statistics Department, Seoul National University

Conducted research in designing an interface between a DBMS and an expert system shell.

GRANTS

National Science Foundation (NSF) **Pedagogical Discourse** is a new study (8/2006) aimed at scaffolding and assessing student interactions within online discussion boards. Using analyses of the discourse, course ontologies and student profiles, we will scaffold learning opportunities by connecting students to each other and to related course material and discussions. We will work with undergraduate computer science students. Participating institutions include USC, UC Irvine and Tulane University. The project is funded by a National Science Foundation, CCLI-Phase 2 (Expansion) grant [Award #0618859].

USC Grants

Summer Internship Grant, 2005 and 2006
Undergraduate Research Intern Grant, Spring 2006.

AWARDS

Meritorious Service Award, University of Southern California/ Information Sciences Institute, 2005.
Best Paper Award, with Jim Blythe, Surya Ramachandran, and Yolanda Gil. "An integrated environment for knowledge acquisition", Intelligent User Interface Conference (IUI-2001).
Meritorious Service Award, University of Southern California/ Information Sciences Institute, 1997.
Second place in the 5th Annual AAAI Mobile Robot Competition and Exhibition, 1996.
Academic Achievement Award, Office for International Students and Scholars, University of Southern California, 4/1996.
Cum Laude, Seoul National University, Korea, 1988.
University Scholarship, Seoul National University, Korea, 1984-1988.

Professional Activities

Workshop/Tutorial Chair

Intelligent User Interfaces Conference, 2005

Publicity Chair

AI in education Conference, 2007
Intelligent User Interfaces Conference, 2003
Intelligent User Interfaces Conference, 2004

Services for Government Organization

NSF Panel (ITR)
Department of Energy Panel

Workshop Organized:

2008 IUI workshop on Collaboration and Recommendation
2007 K-CAP Workshop on Knowledge Capture and Constraint Programming
2007 AAAI Spring Symposium on Interaction Challenges for Artificial Assistants

Program Committee/Reviewer:

Concurrency and Computation: Practice and Experience
Journal of Web Semantics
International Journal of Human Computer Studies
Applied Ontology
IEEE Transactions on Knowledge and Data Engineering
Intelligent Systems
IEEE Expert

International Conference on Knowledge Capture
National Conference on Artificial Intelligence
International Conference on Intelligent User Interfaces
International Conference on Autonomous Agents and Multiagent Systems
The Annual Conference of the Cognitive Science Society
International Conference on Knowledge Capture
International Conference on Intelligent User Interfaces

American Educational Research Association
International Conference of Knowledge Engineering and Knowledge Management
IFCIS Conference on Cooperative Information Systems
International Conference on Tools with Artificial Intelligence
Computer Aided Design of User Interfaces Conference
AAAI symposiums
Workshop on Knowledge Acquisition, Modeling and Management

Services to Korean Organizations

President, KOCSEA (Korean Computer Scientists and Engineers Association in America) 2007-2008
Finance Officer, KOCSEA 2004-2006

Other Services:

ISI, ISD retreat program organizer, 2008
Reviewer for AAAI/SIGART Doctoral Consortium, 2007, 2005
Open house event organizer for Information Sciences Institute, 2005.

Project Deliverables

CAT: A workflow template composition tool. Delivered to SCEC/USC.
JIST: collaborative analysis tool for intelligence analysis. Delivered to SAIC.
KANAL: intelligent analysis of process models. Delivered to SRI
Active Catalogs: Component based design tool. Delivered to Lockheed Martin to support Interactive Gimbal Design systems. Also delivered to Raytheon.

Briefing Sponsors

Maven, DARPA Integrated Learning, November 2007.
Wings/Pegasus framework, SCEC annual meeting, November 2006.
JIST (Just-In-caSe just-in-Time Intelligence Analysis), November, 2005.
CAT: Composition Analysis Tool that analyzes workflows and generates error messages and suggestions in order to help users compose complete and consistent workflows, SCEC all hands meeting for NSF review, February, 2004.
ECHO: developing metacognitive capabilities for advice taking agents, DARPA IPTO workshop, October 2003.
KANAL/Action Editor (plan critiquing tool) at the DARPA RKF (Rapid Knowledge Formation) PI workshop, October 2002.
SLICK (proactive dialogue tool for knowledge acquisition) at the DARPA RKF (Rapid Knowledge Formation) PI workshop, October 2002.
SHAKEN (an integrated knowledge acquisition tool) as a team of SRI International, the University of Texas at Austin, Boeing, Northwestern university, University of West Florida, and ISI/University of Southern California, at the DARPA RKF (Rapid Knowledge Formation) PI workshop, October 2001.
Expert Panel (assessment of the quality of knowledge base built by biologists), a collaboration with Information Extraction and Transport Inc., Stanford, Cycorp, SRI International, Pragati Inc., and ISI/University of Southern California, at the DARPA RKF (Rapid Knowledge Formation) PI workshop, October 2001.
KANAL (Knowledge ANALysis) demo as a team at the DARPA RKF(Rapid Knowledge Formation) PI workshops, in January 2001.
EMeD (EXPECT Method Developer) demo at the DARPA HPKB (High Performance Knowledge Base) PI workshops in January and October 1999.
Active Catalogs demo at the DARPA ITO visit in January 1998.
Active Catalogs project progress and demo at the DARPA RaDEO PI workshop in August 1997.

PUBLICATIONS

Journal papers

Jihie Kim, Yolanda Gil, Marc Spraragen, Principles for Interactive Acquisition and Validation of Workflows, *Journal of Experimental and Theoretical Artificial Intelligence (JETAI)* (to appear).

Jihie Kim and Yolanda Gil, Incorporating Tutoring Principles into Interactive Knowledge Acquisition, *International Journal of Human-Computer Studies*, Volume 65, Issue 10, October 2007, Pages 852-872.

Jihie Kim, , Ewa Deelman, Yolanda Gil, Guarang Mehta, Varun Rathnakar, " Provenance Trails in the Wings/Pegasus System", *CONCURRENCY AND COMPUTATION: PRACTICE AND EXPERIENCE*, November, 2007.

P. Maechling, H. Chalupsky, M. Dougherty, E. Deelman, Y. Gil, S. Gullapalli, V. Gupta, C. Kesselman, J. Kim, G. Mehta, B. Mendenhall, T. Russ, G. Singh, M. Spraragen, G. Staples, and K. Vahi., Simplifying Construction of Complex Workflows for Non-Expert Users of the Southern California Earthquake Center Community Modelling Environment, in *ACM SIGMOD Record*, special issue on Scientific Workflows, Volume 34 , Issue 3 (September 2005), 2005.

Jihie Kim, Peter Will, Ringo Ling and Robert Neches, "Active Catalog Services for Internet-Based Design", *Journal of Artificial Intelligence for Engineering Design, Analysis and Manufacturing (AI EDAM)*, Volume 17, issue 4, 2003.

Marcello Tallis, Jihie Kim and Yolanda Gil, "User Studies Knowledge Acquisition Tools: Methodology and Lessons Learned", *Journal of Experimental and Theoretical Artificial Intelligence*, 2001.

Jihie Kim and Paul. S. Rosenbloom, "Bounding the Cost of Learned Rules", *Artificial Intelligence Journal* Vol. 120, No.1, 2000, pp. 32--80

Wei-Min Shen, Jafar Abidi, Bonghan Cho, G. Kaminka, Jihie Kim, Behnam Salemi, Sheila Tejada, "YODA: The young observant discovery agent", In *AI Magazine*, Spring 1997, 18(1).

Proceedings Edition

Lawrence Bergman, Jihie Kim, Bamshad Mobasher, Stefan Rueger, Stefan Siersdorfer, Sergej Sizov, Markus Stolze: International workshop on recommendation and collaboration (ReColl 2008). *Intelligent User Interfaces 2008*: 439

Conference papers

Jihie Kim, Erin Shaw, Sujith Ravi, Erin Tavano, Aniwat Arromratana, and Pankaj Sarda, Scaffolding On-line Discussions with Past Discussions: An Analysis and Pilot Study of PedaBot, *The 9th International Conference on Intelligent Tutoring Systems Conference (ITS 2008)*, 2008.

Sujith Ravi and Jihie Kim, Profiling Student Interactions in Threaded Discussions with Speech Act Classifiers, *Proceedings of the AI in Education Conference*, 2007

Yolanda Gil, and Varun Ratnakar, Ewa Deelman, Marc Spraragen, Jihie Kim, Wings for Pegasus: A Semantic Approach to Creating Very Large Scientific Workflows, *In the Nineteenth Conference on Innovative Applications of Artificial Intelligence (IAAI-2007)*, 2007.

- J. Kim, Y. Gil, V. Ratnakar Semantic Metadata Generation for Large Scientific Workflows, *Proceedings of the International Semantic Web Conference (ISWC-2006)*, 2006.
- D. Feng, J. Kim, E. Shaw, E. Hovy Towards Modeling Threaded Discussions through Ontology-based Analysis. *Proceedings of the National Conference on Artificial Intelligence (AAAI-06)*, 2006.
- D. Feng, E. Shaw, J. Kim, E. Hovy Learning to Detect Conversation Focus of Threaded Discussions. *Proceedings of the Joint Human Language Technology Conference/Annual Meeting of the North American Chapter of the Assoc. for Computational Linguistics (HLT-NAACL 2006)*, 2006.
- Donghui Feng, Erin Shaw, Jihie Kim, and Ed Hovy, An Intelligent Discussion-Bot for Answering Student Queries in Threaded Discussions, *Proceedings of the International Conference on Intelligent User Interfaces (IUI-2006)* , 2006.
- Jihie Kim, From Reflection to Interaction: Use of Memory in Interactive Knowledge Acquisition, *Proceedings of CogSci 2005*, 2005.
- Jihie Kim, Marc Spraragen, and Yolanda Gil An Intelligent Assistant for Interactive Workflow Composition, *Proceedings of the International Conference on Intelligent User Interfaces (IUI-2004)* , 2004.
- M.Pool, K.Murray, J.Fitzgerald, M.Mehrotra, R.Schrag, J.Blythe, J.Kim, H.Chalupsky, P.Miraglia, T.Russ,D.Schneider Evaluating SME-Authored COA Critiquing Knowledge, *Proceedings of the International Conference on Knowledge Capture (K-CAP 2003)*, 2003.
- Ken Barker, Jim Blythe, Gary Borchardt, Vinay K. Chaudhri, Peter E. Clark, Paul Cohen, Julie Fitzgerald, Ken Forbus, Yolanda Gil, Boris Katz, Jihie Kim, Gary King, Sunil Mishra, Ken Murray, Charley Otsott, Bruce Porter, Robert C. Schrag, Tomas Uribe, Jeff Usher, and Peter Z. Yeh. "A Knowledge Acquisition Tool for Course of Action Analysis". *The Fifteenth Innovative Applications of Artificial Intelligence Conference (IAAI-2003)*, Acapulco, Mexico, 2003.
- Jihie Kim and Yolanda Gil "Interactive Acquisition of Behavior Models". *Proceedings of the 2003 Conference on Behavior Representation in Modeling and Simulation (BRIMS)*, 2003.
- Jihie Kim and Yolanda Gil, "Proactive Acquisition from Tutoring and Learning Principles", *Proceedings of the Artificial Intelligence in Education (AIED 2003)*, 2003.
- Jihie Kim and Jim Blythe, Supporting Plan Authoring and Analysis, *Proceedings of the Intelligent User Interfaces Conference*, Miami Beach, FL, 2003. (IUI-2003)
- Jihie Kim and Yolanda Gil, Deriving Acquisition Principles from Tutoring Principles, *Proceedings of the Intelligent Tutoring Systems Conference*, Biarritz, France, June 5--7, 2002, (ITS-2002)
- Yolanda Gil and Jihie Kim, Interactive Knowledge Acquisition Tools: A Tutoring Perspective, *Proceedings of the 24th Annual Meeting of the Cognitive Science Society*, George Mason University, Fairfax, Virginia, 2002 (COGSCI-2002).
- Jihie Kim and Yolanda Gil, "Knowledge Analysis on Process Models", 2002, *Proceedings of the International Joint Conference on Artificial Intelligence*, pp. 165-168 (IJCAI-2001).
- Jim Blythe, Jihie Kim, Surya Ramachandran, and Yolanda Gil, An Integrated Environment for Knowledge Acquisition, *Proceedings of the Intelligent User Interface Conference (IUI-2001)*, *Best Paper Award*.
- Jihie Kim and Yolanda Gil, Acquiring Problem-Solving Knowledge from End Users: Putting Interdependency Models to the Test, *Proceedings of the Seventeenth National Conference on Artificial Intelligence*, 2000, pp. 223-229. (AAAI-2000)

Jihie Kim and Yolanda Gil, Interdependency-Based Interface for Acquiring Problem-Solving Knowledge, 2000, *Proceedings of the International Conference on Intelligent User Interfaces*, pp. 165-168 (IUI-2000).

Jihie Kim and Yolanda Gil, "Deriving Expectations to Guide Knowledge Base Creation", In proceedings of the Sixteenth National Conference on Artificial Intelligence, 1999, pp. 235- 241. (AAAI-99)

Murilo Coutinho, Ragy Eliesh, Jihie Kim, Vished Kumar, Ringo Ling, Bob Neches and Peter Will, Active Catalogs: Integrated Support for Component Engineering, *18th ASME Computers in Engineering Conference, 1998* (ASME-98).

Ringo Ling, Jihie Kim, and Peter Will, "Active Catalog: Searching and Using Catalog Information in Internet-based Design", *17th ASME Computers in Engineering Conference, 1997* (ASME-97).

Jihie Kim and Paul S. Rosenbloom, "Learning efficient rules by maintaining the explanation structure", *In proceedings of the Thirteenth National Conference on Artificial Intelligence*, 1996, pp.763-770 (AAAI-96).

Jihie Kim and Paul S. Rosenbloom, "Constraining learning with search control", *In proceedings of the Tenth International Conference on Machine Learning*, 1993, pp.174-181 (ML-93).

Thesis

Jihie Kim, "Bounding the Cost of Learned Rules: A Transformational Approach", Ph.D. Thesis, University of Southern California, 1996.

Jihie Kim, "Developing an interface for accessing data base management system from expert system shell", Masters Thesis, Seoul National University, 1990.

Other papers and presentations

Jihie Kim and Yolanda Gil (2008), Developing a Meta-Level Problem Solver for Integrated Learners, Metareasoning: Thinking about thinking workshop in AAAI 2008.

Sujith Ravi, Jihie Kim, and Erin Shaw (2007), Mining On-line Discussions: Assessing Technical Quality for Student Scaffolding and Classifying Messages for Participation Profiling, Educational Data Mining workshop in AIED2007.

Jihie Kim, Erin Shaw, Erin Tavano, Aniwat Arromratana, Pankaj Sarda, and Carole Beal, Towards automatic scaffolding of on-line discussions in engineering courses, *American Educational Research Association (AERA 2008)*, 2008.

Jihie Kim, Erin Shaw, Grace Chern and Roshan Herbert, Novel tools for assessing student discussions: Modeling threads and participant roles using speech act and course topic analysis, *Proceedings of the AI in Education Conference (poster)*, 2007.

Jihie Kim, Grace Chern, Erin Shaw, and Donghui Feng, Erin Shaw, An Intelligent Discussion-Bot for Guiding Student Interactions in Threaded Discussions , *Proceedings of the AAAI 2007 Spring Symposium on Interaction Challenges for Intelligent Assistants*, 2007.

Jihie Kim, Grace Chern, Donghui Feng, Erin Shaw, and Eduard Hovy, Mining and Assessing Discussions on the Web through Speech Act Analysis, *Proceedings of the ISWC'06 Workshop on Web Content Mining with Human Language Technologies*, 2006.

Jihie Kim, Grace Chern, and Erin Shaw, Towards automatic assessment of on-line discussions: Analyzing student "speech acts" , *American Educational Research Association (AERA 2007)*, 2007

Jihie Kim and Carole Beal, Turning quantity into quality: Supporting automatic assessment of on-line discussion contributions, *American Educational Research Association (AERA 2006)*, 2006.

Jihie Kim, Meta-Level Patterns for Interactive Knowledge Capture, *Proceedings of K-CAP 2005*, 2005.

Jihie Kim, Memory-Based Meta-Level Reasoning for Interactive Knowledge Capture, *Proceedings of the AAAI Spring Symposium on Metacognition in Computation*, 2005.

Yolanda Gil, Tim Chklovski, and Jihie Kim, Organizing Argumentation Statements to Support Intelligence Analysis, *Proceedings of the Intelligent User Interfaces for Intelligence Analysis Workshop*, 2005.

Jihie Kim, Carole Beal, and Zeeshan Maqbool, Developing Teaching Aides for Distance Education, *Proceedings of the AI in Education (AIED 2005)*, 2005

Jihie Kim, Marc Spraragen, and Yolanda Gil, A Knowledge-Based Approach to Interactive Workflow Composition, *Proceedings of ICAPS Workshop on Planning and Scheduling for Web and Grid Services, at the 14th International Conference on Automatic Planning and Scheduling* , 2004.

Jihie Kim and Yolanda Gil, Towards Interactive Composition of Semantic Web Services, *Proceedings of the AAAI Spring Symposium on Semantic Web Services*, 2004.

Jihie Kim and Yolanda Gil, Towards Interactive Composition of Semantic Web Services, *2nd International Semantic Web Conference (ISWC 2003)*, 2003.

Jihie Kim and Jim Blythe, Supporting Plan Authoring and Analysis, *Proceedings of K-CAP Workshop on Capturing Knowledge from Domain Experts: Progress and Prospects 2003*.

Jihie Kim, "Dialogue Manager for Knowledge Acquisition", In K-CAP workshop on Interactive Tools for Knowledge Capture (2001).

Yolanda Gil, Jim Blythe, Jihie Kim and Surya Ramachandran, "Acquiring Procedural Knowledge in EXPECT", In AAAI 2000 Fall Symposium on Learning How to Do Things.

Mark Musen, Jihie Kim and Natasha Noy, "DARPA HPKB program", Knowledge Acquisition Workshop, 1999.

Jihie Kim, Ringo Ling, and Peter Will, "Ontology Engineering for Active Catalog", 1997 , 1997.

Jihie Kim and Paul S. Rosenbloom, "Transformational analyses of learning in Soar", Technical Report, ISI/RR-95-4221, Information Sciences Institute and Computer Science Department, University of Southern California, 1995.

Jihie Kim, "Learning high utility rules by incorporating search control", Technical Report, USC-CS-94-580, 1994.

Jihie Kim and Suk I. Yoo, "A design of an interface for accessing data base management system from expert system shell", In proceedings of the Korean Information Science Society, 1989.

Jihie Kim and Paul S. Rosenbloom, "Mapping EBL onto Soar", Fifteenth Soar Workshop, Carnegie Mellon University, Septemeber 15-17, 1995, pp.156-158.

Jihie Kim and Paul S. Rosenbloom, "A transformational analysis of chunking", Fifteenth Soar Workshop, Carnegie Mellon University, Sepemeber 15-17, 1995, pp.110-112.

Jihie Kim and Paul S. Rosenbloom, "A transformation from problem solving to chunking", Fourteenth Soar Workshop, The University of Michigan. December 9-11, 1994, pp.1-5.

Jihie Kim and Paul S. Rosenbloom, "Constraining learning with search control", Twelfth Soar Workshop, University of Southern California. June 4-6, 1993.

Jihie Kim and Paul S. Rosenbloom, "Solving the expensive chunks problem", Eleventh Soar Workshop, Carnegie Mellon University, October 23-25, 1992.

University Services

PhD Admissions Committee

Computer Science Dept, 2003-2007

Research Activities Presentation (orgnizer)

Computer Science Dept, 2005, 2006

Intelligent Systems Demo Event (organizer)

Information Sciences Institute, 2005

research faculty candidates (reviewer)

Computer Science Dept, 2003,2006

Students

PhD students: Sujith Ravi, Marc Spraragen, Donghui Feng, Hyokyeong Lee

MS students: Roshan Herbert, Parthiban Ramasubramanian, Amit Agarwal, Sid Shaw,

Zeeshan Maqbool

Undergrad students: Edward Kim (NSF SURE/REU program),

Varun Bahda (USC Summer Intern program)

PROFESSIONAL MEMBERSHIPS

ACM

AAAI

AERA (American Educational Research Association)