

## Ms. Hui Wan

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CONTACT INFORMATION	Department of Computer Science State University of New York at Stony Brook Stony Brook, NY 11794-4400 Email: <i>hwan@cs.sunysb.edu</i> WWW: <a href="http://www.cs.sunysb.edu/~hwan">http://www.cs.sunysb.edu/~hwan</a>	
EDUCATION	<b>Ph.D., Computer Science</b> State University of New York at Stony Brook <i>Dissertation:</i> Reasoning about Uncertainty and Correlated Beliefs <i>Advisor:</i> Professor Michael Kifer	May 2010 (expected)
	<b>M.S., Computer Science</b> State University of New York at Stony Brook	Aug 2005
	<b>M.E., Computer Science</b> Institute of Software, Chinese Academy of Sciences	July 2003
	<b>B.S., Computer Science</b> University of Science and Technology of China Special Class for the Gifted Young	July 2000
RESEARCH INTERESTS	<ul style="list-style-type: none"><li>• Knowledge Representation and Reasoning, Artificial Intelligence</li><li>• Logic Programming, Programming Languages</li><li>• Semantic Web, Web Services</li><li>• Data Mining, Machine Learning</li><li>• Probabilistic Modeling, Statistical Modeling</li><li>• Deductive Databases</li></ul>	
RESEARCH PROJECTS	<b>Research Assistant</b> State University of New York at Stony Brook, Computer Science Department	May 2004 - present
	<ul style="list-style-type: none"><li>• <b>BLP</b> (Belief Logic Programming) The center piece of my dissertation research, a novel form of quantitative knowledge representation for reasoning with uncertain and inconsistent information. BLP addresses the problem of combining and correlating evidence obtained from non-independent and possibly conflicting information sources, which is one of the main challenges in knowledge base systems for real-world applications. BLP has the following advantages over the previous efforts to integrate uncertainty and logic programming.<ul style="list-style-type: none"><li>◊ BLP elegantly models uncertainty and correlation between uncertain events.</li><li>◊ BLP correlates structural information contained in rules and provides more accurate certainty estimates.</li><li>◊ BLP does not depend on a particular method of combining evidence. In fact, different combination methods can be used simultaneously for different types of uncertain information.</li></ul>Research results on BLP were presented in a series of publications.</li></ul>	

- ◊ In LPNMR paper, I defined the BLP framework and developed the declarative semantics, which is the mathematical foundation for representing and reasoning with partial, correlated, and conflicting pieces of information.
  - ◊ In SUM paper, I developed the operational semantics and efficient algorithms that can answer queries for non-ground programs with the help of an SLD-like procedure.
  - ◊ In RR paper, I extended the semantics of BLP to allow cyclic dependencies, which is a common challenge for most quantitative logic frameworks.
- **SILK** (Semantic Inferencing on Large Knowledge base)  
 SILK is a multi-institution project sponsored by Vulcan Inc. The project aims to provide key knowledge representation infrastructure for global, widely-authored, very large knowledge bases in business and science.
    - ◊ LPDA (Logic Programming with Defaults and Argumentation Theories): A new framework that unifies most of the earlier proposals for defeasible reasoning in logic programs. In LPDA, different logics which define the defeasible behavior can be clearly and easily captured, swapped, combined, and debugged. The implementation is released as part of SILK V1. A paper on LPDA has been published in ICLP 2009.
    - ◊ OpenRuleBench (<http://rulebench.projects.semwebcentral.org/>): A suite of diverse benchmarks for comparing and analyzing the performance and scalability of eleven different rule engines. The study covers five different technologies: Prolog-based, deductive databases, production rules, engines for triples, and general knowledge bases.
  - **FLORA-2** (<http://flora.sourceforge.net/>)  
 A sophisticated object-oriented knowledge base language and application development environment, with applications in intelligent agents, Semantic Web, knowledge-bases networking, ontology management, integration of information, and others. The advanced features of FLORA-2 include:
    - ◊ Transaction logic, applications of which include modeling and reasoning of business processes and workflows, Web services, robotics, planning, view maintenance in databases, and more.
    - ◊ F-logic, which provides a logical foundation for frame-based and object-oriented languages for data and knowledge representation.
    - ◊ HiLog, a logical formalism that provides higher-order and meta-programming features in a computationally tractable first-order setting.

I have been one of the main developers of FLORA-2 for the past six years. My contributions include: the interface between FLORA-2 and DBMS (database management systems); mechanism that allows dynamic addition of rules; syntax extensions of FLORA-2 for Semantic Web; mechanism to support user-specified cardinality constraints; and more.

INDUSTRY  
EXPERIENCE

**Internship**

May 2007 - August 2007

IBM Almaden Research Center, San Jose, CA, USA

Data mining and analysis on patent citations, part of the Business Insights Workbench project. My contributions include:

- ◊ Patent significance assessment by mining unstructured data and citation information.
- ◊ Analysis of inter-company collaboration and assessment of patent revenue by mining company patent portfolios and patent citation information.

**Internship**

May 2006 - November 2006

HP Labs, Bristol, UK

Machine learning and data mining for technical keywords clustering, email classification, social tagging and tag recommendation. My contributions include:

- ◊ Keyword clustering and keyword similarity analysis by applying unsupervised learning techniques on paper abstracts associated with keywords.
- ◊ Research on improving machine learning schemes on email classification including spam filtering and email categorization.
- ◊ Personalized tag recommendation via social network and content-based similarity metrics – an augmentation to social-tag-based recommendation.

TEACHING  
EXPERIENCE

**Teaching Assistant**

September 2003 - May 2005

State University of New York at Stony Brook, Computer Science Department

- Responsibilities include: teaching recitation classes, holding lab sessions and office hours, grading assignments, projects and exams.
- Courses include:
  - ◊ Undergraduate course: Foundations of Computer Science
  - ◊ Graduate course: Database Systems
  - ◊ Undergraduate course: Database Systems
  - ◊ Undergraduate course: Database Transaction Processing Systems
- Outstanding Teaching Assistant Award, SUNY Stony Brook, 2005.

**Substitute Lecture**

Fall 2009

- Graduate course: Database Systems

PUBLICATIONS

**Hui Wan**, Benjamin Grosf, Michael Kifer, Paul Fodor and Senlin Liang, *Logic Programming with Defaults and Argumentation Theories*, Proceedings of 25th International Conference on Logic Programming (ICLP), pp. 432-448, 2009.

**Hui Wan** and Michael Kifer, *Belief Logic Programming: Uncertainty Reasoning with Correlation of Evidence*, Proceedings of 10th International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR), pp. 316-328, 2009.

**Hui Wan** and Michael Kifer, *Query Answering in Belief Logic Programming*, Proceedings of 3rd International Conference on Scalable Uncertainty Management (SUM), pp. 268-281, 2009.

**Hui Wan**, *Belief Logic Programming with Cyclic Dependencies*, Proceedings of 3rd International Conference on Web Reasoning and Rule Systems (RR), pp. 150-165, 2009.

Senlin Liang, Paul Fodor, **Hui Wan** and Michael Kifer, *OpenRuleBench: An Analysis of the Performance of Rule Engines*, Proceedings of 18th International World Wide Web Conference (WWW), pp. 601-610, 2009.

Andrew Bye, **Hui Wan** and Steve Cayzer, *Personalized Tag Recommendations via Social Network and Content-based Similarity Metrics*, International Conference on Weblogs and Social Media (ICWSM), 2007.

**Papers in Preparation**

**Hui Wan**, Benjamin Grosf and Michael Kifer, *A Generalized Framework of Logic Program-*

*ming with Defaults and Argumentation Theories*, In preparation for journal submission.

**Hui Wan** and Michael Kifer, *Reasoning about Uncertainty and Correlated Beliefs*, In preparation for journal submission.

### Technical Report

**Hui Wan** and Michael Kifer, *Belief Logic Programming and its Extensions*, Technical Report, [http://www.cs.sunysb.edu/~hwan/BLP\\_TR.html](http://www.cs.sunysb.edu/~hwan/BLP_TR.html), State University of New York at Stony Brook, 2009.

**Hui Wan**, *Belief Logic Programming*, Ph.D. Thesis Proposal, State University of New York at Stony Brook, 2008.

Guizhen Yang, Michael Kifer, **Hui Wan** and Chang Zhao, *FLORA-2: User's Manual*, <http://flora.sourceforge.net/docs/floraManual.pdf>, 2008.

**Hui Wan**, *Reasoning with Inconsistency and Uncertainty: Paraconsistent and Probabilistic Logic Programming*, Ph.D. Research Proficiency Examination Report, State University of New York at Stony Brook, 2005.

### THESES

*Reasoning about Uncertainty and Correlated Beliefs*, Ph.D. thesis in preparation, State University of New York at Stony Brook, 2010.

*Research on Object Caching and Consistency in Web Application Server*, M.S. thesis, Institute of Software, Chinese Academy of Sciences, 2003.

### PRESENTATIONS

*Belief Logic Programming with Cyclic Dependencies*, International Conference on Web Reasoning and Rule Systems (RR), Chantilly, Virginia, USA, October 2009.

*Query Answering in Belief Logic Programming*, International Conference on Scalable Uncertainty Management (SUM), College Park, Maryland, USA, September 2009.

*Logic Programming with Defaults and Argumentation Theories*, International Conference on Logic Programming (ICLP), Pasadena, California, USA, July 2009.

### REVIEWER

PEPM 2010: ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation

PODS 2009: ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems

PADL 2009: International Symposium on Practical Aspects of Declarative Languages

ESWC 2007: European Semantic Web Conference

SUM 2007: International Conference on Scalable Uncertainty Management

HONORS AND  
AWARDS

Student Fellowship for the 7th and 8th ISWC, NSF, 2008 and 2009.

Student Travel Grant for the 25th ICLP, 2009.

Student Travel Grant for the 3rd International Compulog/ALP Summer School, CRA, 2008.

Outstanding Teaching Assistant, SUNY Stony Brook, 2005.

Graduate Fellowship, SUNY Stony Brook, 2003.

Outstanding Graduate Scholarship, Chinese Academy of Sciences, 2001.

Outstanding Student Scholarship, University of Science and Technology of China, 1997.