

Yuqing Melanie Wu

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Education

Ph.D. in Computer Science	2004	University of Michigan, Ann Arbor
M.S. in Computer Science	1999	Indiana University, Bloomington
M.S. in Computer Science	1998	Peking University, Beijing, China
B.S. in Computer Science	1995	Peking University, Beijing, China

Appointments

Assistant Professor	Computer Science Department, IU	Aug. 2008 – present
Assistant Professor	Informatics Department, IU	Aug. 2004 – Jul. 2008
Research Intern	IBM Almaden Research Center	Jun. 2003 – Dec. 2003
Research Intern	Microsoft Research	May 2002 – Aug. 2002
Research Assistant	University of Michigan	Jan. 2000 – Jun. 2004
Teaching Assistant	Indiana University	Aug. 1999 – Dec. 1999
Lecturer	Informix Authorized Training Center	Oct. 1996 – Jul. 1998
Developer	Boya System Integration Inc	Jan. 1996 – Jul. 1998

Honors and Awards

- Best Paper Award, the 26th British National Conference on Databases (BNCOD), 2009.
- My Ph.D. student Sofia Brenes's paper received the Best Paper Award at the *Ph.D. Workshop of conjunct to the 11th International Conference on Extending Database Technology (EDBT)*, 2008.
- Active Learning Teaching Fellow. Indiana University. 2007.
- Barbour Scholarship. University of Michigan. 2002.
- Rackham Travel Grant. University of Michigan. 2003.
- Graduate Student Research Fellowship. University of Michigan. 2000.

- Graduate Fellowship. Indiana University. 1998,1999.
- GuangHua Graduate Fellowship, 1st Prize (awarded to the top three of the class). Peking University. 1996, 1997, 1998.
- GuangHua Fellowship, 1st Prize (awarded to the top three of the class). Peking University. 1992, 1993, 1994, 1995.
- Procter & Gamble Fellowship (awarded to the top student in the class). Peking University. 1991.

Research

Research Interest

My research focuses on XML database management, including storage management, XML query languages, algebra, indexing, query processing, query optimization and access control. I am also interested in database-related multi-disciplinary research, including the management of domain-specific data, such as bio-informatics and medical-informatics, and the interaction between users and database systems.

Work in Progress

Papers in progress

- Yuqing Wu, Vivek Krishna, Arun Autuchirayll, Amit Balode, and Yong Hyun Yoon. Extracing RDF Schema from the Semantic Web. (in progress)
- Yuqing Wu, Xiaoming Gao, Bhushan Rajadhyax, Chintan Sheth, and Cuifang Lin. Investigating Semantic Association Query in RDF Data - A Survey. (in progress)
- Yuqing Wu, Dirk Van Gucht, Marc Gyssens, and Jan Paredaens, Expressiveness, Normal Form and Optimization of a Positive Fragment of Path Queries. (in progress)

Grant Proposals under Review

- Collaborative Pain Management. Submitted to Robert Wood Johnson Foundation. (under review)
- Reasoning about the Semantic Web. Submitted to IU FRSP. (under review)
- Efficient Query Evaluation of Semi-structured Data. Submitted to IU Oval. (under review)
- The Adaptive XML Index Mechanism and Algorithm Research in Data-space. Submitted to NSF China. (under review)

Grant Proposals in Progress

- Data Mash-up in PHR (Patient Health Record) Systems. (in progress)
- An Incremental Approach for Integrated Taxonomy. With Malika Mahoui. (in progress)

List of Publications*Journals*

1. George H. L. Fletcher, Dirk Van Gucht, Yuqing Wu, Marc Gyssens, Sofia Brenes, and Jan Paredaens. A Methodology for Coupling Fragments of XPath with Structural Indexes for XML Documents. In *Information Systems*, 2009. (to appear)
2. Yuqing Wu, Stelios Pararizos, and H.V.Jagadish. Querying XML in TIMBER. In *IEEE Bulletin of Technical Committee on Data Engineering*. 31(4):15-24, December. 2008.
3. Yuqing Wu. Path Query. *Encyclopedia of Database Systems*. 2008.
4. Huijun Wang, Jonathan Klinginsmith, Xiao Dong, Adam Lee, Rajarshi Guha, Yuqing Wu, Gordon Crippen, and David Wild. Chemical Data Mining of the NCI Human Tumor Cell Line Database. In *Journal of Chemical Information and Modeling*. 47(6):2063-2076. Nov-Dec, 2007.
5. Surajit Chaudhuri, Zhiyuan Chen, Kyuseok Shim, and Yuqing Wu. Storing XML (with XSD) in SQL Databases: Interplay of Logical and Physical Designs. In *IEEE Transactions on Knowledge and Data Engineering*. 17(12): 1595-1609. 2005.
6. Yuqing Wu, Jignesh Patel, and H. V. Jagadish. Using Histograms to Estimate Answer Size for XML Queries. In *Information Systems – Special Issue: Best Papers from EDBT 2002*, 28 (1-2): 33-59, 2003.
7. H. V. Jagadish, Shurug Al-Khalifa, Adriane Chapman, Laks V.S. Lakshmanan, Andrew Nierman, Stelios Pappas, Jignesh M. Patel, Divesh Srivastava, Nuwee Wiwatwattana, Yuqing Wu, and Cong Yu. TIMBER: A Native XML Database. In the *VLDB Journal*, 11(4): 274-291, 2002.

Refereed Conference Proceedings

8. Yuqing Wu, Sofia Brenes, and Hyungdae Yi. Workload-aware Trie Indexes for XML. In the *18th ACM Conference on Information and Knowledge Management*. November, 2009. (to appear)
9. Yuqing Wu, Sofia Brenes, Tejas Totade, Dhaval Damani, Shijin Joshua, and Michel Salim. ASIC: Algebra-based Structural Indices Comparison. In the *18th ACM Conference on Information and Knowledge Management*. November, 2009 (to appear)
10. Yuqing Wu, Namrata Lele, Rashmi Aroskar, and Sharanya Chinnusamy. XQGen - An Algebra-based XPath Query Generator For Micro-Benchmarking. In the *18th ACM Conference on Information and Knowledge Management*. November, 2009. (to appear)
11. Yuqing Wu, Dirk Van Gucht, Marc Gyssens, and Jan Paredaens, A Study of a Positive Fragment of Path Queries: Expressiveness, Normal Form and Minimization. In the *26th British National Conference on Databases*. July, 2009. Best Paper Award.
12. George H. L. Fletcher, Dirk Van Gucht, Yuqing Wu, Marc Gyssens, Sofia Brenes, and Jan Paredaens. A Methodology for Coupling Fragments of XPath with Structural Indexes for XML Documents. In the *11th International Symposium of Database Programming Languages*. September, 2007. Published in the *Lecture Notes in Computer Science Vol.4797*, pp. 48-65. Springer, 2007.

13. Sriram Mohan, Arijit Sengupta, and Yuqing Wu. A Rewrite-based Approach for Enforcing Access Constraints for XML. In the *11th International Conference on Knowledge-based and Intelligent Information and Engineering Systems*. Published in the *Lecture Notes in Computer Science Vol.4694*, pp. 1081-1089. Springer, 2007.
14. Sriram Mohan, and Yuqing Wu. IPAC: An Interactive Approach to Access Control for Semi-Structured Data. In *the Proceedings of the 32nd International Conference on Very Large Data Bases*, pp. 1147-1150. September, 2006.
15. Sriram Mohan, Jonathan Klinginsmith, Arijit Sengupta, and Yuqing Wu. ACXESS - Access Control for XML with Enhanced Security Specification. In the *Proceedings of the 22nd International Conference on Data Engineering*, pp. 171. April, 2006.
16. Yuqing Wu, Jonathan Klinginsmith, and Huanmei Wu. Data Cube Based Tumor Respiratory Motion Characterization. In the *Proceedings of the 48th Annual Meeting of American Association of Physicists in Medicine*, 33(6), pp. 2265. 2006.
17. Jon Klinginsmith, Malika Mahoui, Huanmei Wu, and Yuqing Wu, A Biomedical Patient Data Driven Approach for the Prediction of Tumor, In the *Proceedings of the 48th Annual Meeting of American Association of Physicists in Medicine*, 33(6), pp. 2052. 2006.
18. Sriram Mohan, Arijit Sengupta, and Yuqing Wu. Access control for XML: a dynamic query rewriting approach. In the *Proceedings of the 2005 ACM CIKM International Conference on Information and Knowledge Management*, pp. 251-252. October, 2005.
19. Surajit Chaudhuri, Zhiyuan Chen, Kyuseok Shim, and Yuqing Wu. Storing XML (with XSD) in SQL Databases: Interplay of Logical and Physical Designs. In *the Proceedings of the 20th International Conference on Data Engineering*, pp. 842. March, 2004.
20. Stelios Pappas, Yuqing Wu, Laks V. S. Lakshmanan, and H. V. Jagadish. Tree Logical Classes for Efficient Evaluation of XQuery. In the *Proceedings of the ACM SIGMOD International Conference on Management of Data*, pp. 71-82. June, 2004.
21. Stelios Pappas, Shurug Al-Khalifa, Adriane Chapman, H.V. Jagadish, Laks V.S. Lakshmanan, Andrew Fireman, Jignesh M. Patel, Divesh Srivastava, Nuwee Wiwatwattana, Yuqing Wu, and Cong Yu. TIMBER: A Native System for Querying XML. In the *Proceedings of the 2003 ACM SIGMOD International Conference on Management of Data*, pp. 672. June, 2003.
22. Yuqing Wu, Jignesh Patel and H.V. Jagadish, Structural Join Order Selection for XML Query Optimization. In the *Proceedings of the 19th International Conference on Data Engineering*, pp. 443-454. March, 2003.
23. Tengjiao Wang, Shiwei Tang, Dongqing Yang, Jun Gao, Yuqing Wu, and Jian Pei. COMMIX: Towards Effective Web Information Extraction, Integration and Query Answering. In the *Proceedings of the 2002 ACM SIGMOD International Conference on Management of Data*, pp. 620. June, 2002.
24. Yuqing Wu, Jignesh M. Patel and H.V. Jagadish. Estimating Answer Sizes for XML Queries. In *Advances in Database Technology - The Proceeding of the 8th International Conference on Extending Database Technology*, pp. 590-608. March, 2002.

25. Shurug Al-Khalifa, H. V. Jagadish, Nick Koudas, Jignesh M. Patel, Divesh Srivastava and Yuqing Wu. Structural Joins: A Primitive for Efficient XML Query Pattern Matching. In the *Proceedings of the 18th International Conference on Data Engineering*, pp. 141-143. February, 2002.
26. Yuqing Wu, Dogging Yang, and Shiwei Tang. Sharing Spatial Information among Heterogeneous Geographic Information System, In the Proceeding of *the 15th National Conference on Database Systems (China)*. 1998.

Refereed Workshop Proceedings

27. Sofia Brenes, Yuqing Wu, Dirk Van Gucht, and Pablo Santa Cruz. Trie Indexes for Efficient XML Query Evaluation. In the *11th International Workshop on the Web and Databases*. June, 2008.
28. Sofia Brenes, (Advisor Yuqing Wu), Structural Summaries for Efficient XML Query Processing. In the *Ph.D. Workshop of conjunct to the 11th International Conference on Extending Database Technology*. March, 2008. Best Paper Award.
29. George H. L. Fletcher, Dirk Van Gucht, Yuqing Wu, Marc Gyssens, and Jan Paredaens. Coupling Fragments of XPath with XML Indexing and Query Decomposition. In the *Proceedings of the 1st Workshop on Emerging Research Opportunities for Web Data Management (EROW 2007) Collocated with the 11th International Conference on Database Theory (ICDT 2007)*. January, 2007.
30. Stelios Paparizos, Shurug Al-Khalifa, H. V. Jagadish, Laks V.S. Lakshmanan, Andrew Nierman, Divesh Srivastava, and Yuqing Wu. Grouping in XML. In the *EDBT Workshop on XML-based Data Management and Multimedia Engineering (XMLDM'02)*, Published in Springer-Verlag, *Lecture Notes in Computer Science Vol.2490*, pp. 128-147. 2002.

Software Artifacts

31. Yuqing Wu, Sofia Brenes, Tejas Totade, Dhaval Damani, Shijin Joshua, and Michel Salim. ASIC: Algebra-based Structural Indices Comparison. In the *18th ACM Conference on Information and Knowledge Management November, 2009*. (to appear)
32. Yuqing Wu, Namrata Lele, Rashmi Aroskar, and Sharanya Chinnusamy. XQGen - An Algebra-based XPath Query Generator For Micro-Benchmarking. In the *18th ACM Conference on Information and Knowledge Management*. November, 2009. (to appear)
33. Sriram Mohan, and Yuqing Wu. IPAC: An Interactive Approach to Access Control for Semi-Structured Data. Demo at *the 32nd International Conference on Very Large Data Bases*. September, 2006.
34. Sriram Mohan, Jonathan Klinginsmith, Arijit Sengupta, and Yuqing Wu. ACXESS - Access Control for XML with Enhanced Security Specification. Demo at *the 22nd International Conference on Data Engineering*. April, 2006.
35. Stelios Paparizos, Shurug Al-Khalifa, Adriane Chapman, H.V. Jagadish, Laks V.S. Lakshmanan, Andrew Nierman, Jignesh M. Patel, Divesh Srivastava, Nuwee Wiwatwattana, Yuqing Wu, and Cong Yu. TIMBER: A Native System for Querying XML. Demo at *the 2003 ACM SIGMOD International Conference on Management of Data*. June, 2003.

36. Tengjiao Wang, Shiwei Tang, Dongqing Yang, Jun Gao, Yuqing Wu, and Jian Pei. COMMIX: Towards Effective Web Information Extraction, Integration and Query Answering. Demo at *the 2002 ACM SIGMOD International Conference on Management of Data*. June, 2002.

Other Publications

37. Sofia Brenes, Yuqing Melanie Wu, and Hyungdae Yi. Workload-aware Trie Indexes for XML, Technical Report 673, Computer Science Department, Indiana University, January, 2009.
38. Yuqing Wu, Dirk Van Gucht, Marc Gyssens, and Jan Paredaens. A Study of Positive XPath with Parent/Child Navigation, Technical Report 660, Computer Science Department, Indiana University, March, 2008.
39. George H. L. Fletcher, Dirk Van Gucht, Yuqing Wu, Marc Gyssens, and Jan Paredaens. A Methodology for Coupling Fragments of XPath with Structural Indexes for XML Documents. Technical Report 639, Computer Science Department, Indiana University. October, 2006.
40. Sriram Mohan, Arijit Sengupta, and Yuqing Wu. A Framework for Access Control for XML. Technical Report 633, Computer Science Department, Indiana University. July, 2006.
41. Sriram Mohan, Arijit Sengupta, Yuqing Wu, and Jonathan Klinginsmith. Access Control for XML - A Dynamic Query Rewriting Approach. Technical Report 609, Computer Science Department, Indiana University. February, 2005.

Research Grants

- Asian American Students and Access to Higher Education. Summer Research Grant, College of Art and Sciences, Indiana University, 2009-2010. \$8,000. Co-PI.
- ACXESS: Access Control for XML with Enhanced Security Specification. Indiana University Faculty Research Support Program (FRSP). 2005-2006, \$30,600. PI.
- Chemical Informatics and Cyber infrastructure Collaboration program. NIH. 2004-2007. \$731,750. Senior Participant.

Patents

- US Patent No. 7451144 – Method of Pattern Searching. Klcklaos Koudas, Divesh Srivastava, Jignesh Paten, Shurug Al-Khalifa, H.V. Jagadish, Yuqing Wu. Issued Nov. 8, 2008.
- US Patent No. 7228312 – Transformation tool for mapping XML to relational database. Surajit Chaudhuri, Zhiyuan Chen, Kyuseok Shim, Yuqing Wu. Issued June 5, 2007.

Invited Talks

- Invited talk at Peking University, Structural Summaries for Efficient XML Query Processing. May, 2008.
- Invited talk at TianJin Normal University, Efficient Evaluation of Semi-structured Data. May, 2008.

- Invited talk at Renmin University, Structural Summaries for Efficient XML Query Processing. May, 2008.
- Invite talk at Indiana University-Purdue University, Indianapolis (IUPUI), Coupling Theoretical Study of Query Language and System Design. Apr, 2008.
- Invited talk at Data and Search Institute, Indiana University. Coupling Fragments of XPath Algebra with Structural Indices of XML Documents. Oct, 2007.
- Invited talk at Informatics Colloquium of Indiana University. Securing Access to XML Data. Sep, 2006.
- Invited talk at COE (Center of Excellency), Indianapolis, Medical Data Processing. Mar, 2006.
- Invited talk at Google Inc., XML – The Research and Implementation. Nov. 2005.
- Invited talk at Computer & Information Technology Colloquium at Indiana University-Purdue University, Indianapolis (IUPUI). XML – The Research and Implementation. Sep. 2005.
- Invited talk at Peking University, China, XML Query Processing and Optimization. Jun. 2005.
- Invited talk at University of Toronto. Tree Logic Class for Efficient XML Query Processing. May 2005.
- Invited talk at Oakland University. XML Query Processing and Optimization. Oakland University. Mar, 2005.
- Invited talk at the Women in Computing (WIC) technical colloquium, Storing and Querying Semi-structural (XML) Data. Nov. 2004.
- Expert panelist at CASCON (IBM Centers for Advanced Studies Conference). Oct. 2002.

Teaching

Teaching Summary

I have been heavily involved in curriculum development and have taught data and information management related courses at both the undergraduate and the graduate levels. I have taught five different courses, including two that I proposed and designed, and have frequently guest-lectured in other courses. Besides serving as research advisor and as a research committee member for numerous Ph.D. students, I have supervised Ph.D. and MS students via independent study courses and research reading courses, many of which led to successful publications.

Courses Development Activities

Undergraduate Courses

- Awarded the Active Learning Fellowship by Indiana University in 2007 for adopting active learning techniques in the redesign of the *Information Representation* course.

- Proposed and design the undergraduate course *Web-based Database Application Design and Implementation* for Informatics Department. Taught the course in fall 2006, 2007, and 2008. Incorporated term-long projects into the course's syllabus. Some of the projects led to undergraduate capstone projects and software products.
- Taught Informatics undergraduate core course *Information Representation* in spring 2005, 2006, 2007, 2008. Redesign and readjust the course material and teaching methods for each of the offering.

Graduate Courses

- Proposed and designed the advanced graduate course *Database Systems and Internal Design* for the Computer Science Department. Taught the course in spring 2006, 2007, 2008, and 2009. Incorporated term-long research projects into the course's syllabus. Seven course projects led to publications/submission.
- Taught graduate level introductory course *Fundamental Computer Concepts in Informatics* in fall 2004.
- Co-taught the *Data and Search Informatics* course in fall 2008.
- Supervised student research projects through *Independent Study, Advanced Research, and Thesis Readings and Research* courses for over 130 credit hours.

Guest Lectures

- Invited to teach guest lectures in the courses *Advanced Database Concepts, Introduction to Informatics, Computer Science Undergraduate Honor Seminar, and Seminar in Chemical Informatics.*

Students Supervised

As chair (co-chair) of research committee

2004-2007	Sriram Mohan	<i>ACXESS - A Framework for Designing Specifying and Enforcing Access Control for XML</i> (Ph.D. 2007)
2006-	Sofia Brenes	Structural Summery of XML for Efficient Query processing (Ph.D. expected 2009)

As member of research committee

2006-2007	Ying Liu	<i>Query Optimization for Distributed Stream Processing</i> (Ph.D. 2007)
2005-2007	Yi Huang	<i>Scalable Web Service-Based XML Message Brokering Across Organizations</i> (Ph.D. 2007)
2007-2008	Hui Zhang	<i>Physically Interacting with Four Dimensions</i> (Ph.D. 2008)
2006-2009	Ahmet Sayar	<i>High Performance, Federated, Service-Oriented Geographic Information Systems</i> (Ph.D. 2009)

2009- Scott Jensen *A Generalized SOA Repository for Complex Scientific Metadata*

As chair of advisory committee

2008- Jonathon Klinginsmith

2008- Mo Zhou

As member of advisory committee

2005-2006 Ying Liu

2005-2008 Hui Zhang

2006-2009 Scott Jensen

2006-2008 Xiao Dong

2008- Heejoon Chae

2008- Jay Powell

- Supervised student research projects through *Independent Study*, *Advanced Research*, and *Thesis Readings and Research* courses for a total of 115 credit hours. The following are the students with whom I co-authored papers.

<i>Student</i>	<i>publications</i>
Sofia Brenes	1 journal paper, 3 conference papers
Jonathan Klinginsmith	1 journal paper, 5 conference papers, 1 software artifact, 1 technical report
Huijun Wang	1 journal paper
Pablo Santa Cruz	1 conference paper
Sriram Mohan	4 conference papers, 2 software artifacts, 2 technical reports
Hyungdae Yi	1 technical report

Teaching Grants and Awards

IU ISS	Learning via Group Activities	2007-2008	\$1,500
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Service

Professional Service

Conference Organization

- Publicity chair for Symposium on Principles of Database Systems (PODS) 2010.
- Workshop local arrangements chair for the ACM SIGMOD International Conference on Management of Data, 2010.
- Local organizer for Midwest Database symposium 2005 - 2008.
- Organizer of the Indiana Women In Computer Conference (InWIC) 2008.

Journal review

VLDB Journal

Data & Knowledge Engineering (DKE)

IEEE Transactions on Knowledge and Data Engineering (TKDE)

World Wide Web journal (WWW)

Information Systems (IS)

ACM Computing Survey

Journal of Systems and Software

ACM Transaction on Internet Technology

Software: Practice and Experience

Journal of Electronics and Telecommunication Research Institute

Concurrency and Computation: Practice and Experience (CCPE)

Conference program committee

International Conference on Very Large Data Bases (VLDB)	2009
IEEE International Conference on Data Engineering (ICDE)	2007, 2008, 2009
ACM Conference on Information and Knowledge Management (CIKM)	2008, 2009
International Conference on Knowledge Management and Information Sharing (KMIS)	2009
International Conference on Networked Digital Technologies (NDT)	2009
Asia Pacific Web Conference (APWeb)	2008
ACM Conference on Computer And Communication Security	2007

IEEE International Conference on Advanced Information Networking and Application 2007

Workshop program committee

<i>Workshop title</i>	<i>Held in conjunction with</i>	<i>Year</i>
ACM International Workshop on Web Information and Data Management	ACM Conference on Information and Knowledge Management (CIKM)	2008
SIGMOD PhD workshop on Innovative Database Research (IDAR)	ACM SIGMOD International Conference on Management of Data	2007, 2008
VLDB PhD workshop	International Conference on Very Large Data Bases (VLDB)	2007
International XML Database Symposium (XSym)	ACM SIGMOD International Conference on Management of Data	2005, 2006
International Workshop on Database Interoperability (InterDB)	IEEE International Conference on Data Engineering (ICDE)	2006
IEEE International Workshop on Mining Evolving and Streaming Data	IEEE International Conference on Data Mining (ICDM)	2006
International Workshop on Web-based Massive Data Processing	International Conference on Web Information System Engineering	2006
International Workshop on Conceptual Model-Directed Web Information Integration and Mining (CoMWIM)	International Conference on Conceptual Modeling (ER)	2004

Grant review

Kentucky Science and Engineering Foundation 2006

Book review

Security in Decentralized Data Management

Professional memberships

- IEEE Computer Society
- Association for Computing Machinery (ACM)

University Service

Faculty advisor for AGEF (Alliance for Graduate Education and the Professoriate) of Indiana University	2005 –
Professional Development Committee of APAFSC (Asian Pacific American Faculty & Staff Community Council)	2005 –

School Service

Globalization Committee	2005 – 2007
Faculty advisor for Women in Computer (WIC)	2004 –
Recruitment visits to universities in China	2005, 2008

Departmental Service

Graduate Program Committee	Informatics Department	2006 – 2007
Graduate Admission Committee	Informatics Department	2004 – 2006
Graduate Admission and Awards Committee	Computer Science Department	2004 –
Faculty Affairs Committee	Computer Science Department	2008 –
Systems Prelim Exam Committee	Computer Science Department	2005 – 2006