MURALI MANI

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EDUCATION

PhD, Computer Science, Jul 2003 (PhD Thesis: Data Modeling using XML Schemas, Advisor: Richard R. Muntz)	University of California, Los Angeles
MS, Computer Science, Mar 2000	University of California, Los Angeles
BTech, Computer Science and Engineering, Jun 1998	IIT, Madras, INDIA

WORK EXPERIENCE

Assistant Professor, Computer Science Dept, WPI	Jul 2003 – Present
Research Assistant, UCLA	Sep 1998 – Jun 2003
Intern, IBM Almaden	Jun 1999 – Mar 2000, Jun 2000 – Dec 2000
Teaching Assistant, UCLA	Jan 2002 – Mar 2003, Jan 2000 – Jun 2000
Teaching Assistant, IIT Madras	Spring 1998, Fall 1997

RESEARCH AND SCHOLARSHIP

RESEARCH AWARDS RECEIVED

[G1] NSF, SGER ($120,327 from Sep 2009 – May 2011), Towards a Generic Provenance Metadata Management System, PI: Murali Mani

[G2] NSF: IDM, ($360,000 from Aug 2005 – Jul 2009) Automaton Meets Algebra: Towards an XML-Centric Stream Query System, PI: Elke A. Rundensteiner, Co-PI: Murali Mani.

[G3] NSF: REU Supplement, ($12,000 from May 2006 - Aug 2007) Automaton Meets Algebra: Towards an XML-Centric Stream Query System, PI: Elke A. Rundensteiner, Co-PI: Murali Mani.

[G4] NSF: REU Supplement, ($12,000 from May 2007 - Aug 2008) Automaton Meets Algebra: Towards an XML-Centric Stream Query System, PI: Elke A. Rundensteiner, Prof. Murali Mani.

[G5] NSF: Infrastructure, ($100,000 in 2006), CRI: High-Performance Infrastructure for Scalable Data-Intensive Applications, PI: Elke A. Rundensteiner, Co-PIs: George Heineman, Murali Mani.

[G6] US Dept of Education ($1,992,306 from July 2007 - June 2011), Making Longitudinal Web-Based Assessments Give Cognitively Diagnostic Reports to Teachers, Parents & Students While Employing Mastery Learning, Kenneth Koedinger & Brian Junker, CMU, Neil Heffernan, George Heineman & Murali Mani, WPI.

[G7] WPI RDC grant ($4500) from Aug 15, 2004 - May 31, 2005, PI: Murali Mani.

[G8] WPI Undergraduate Summer Research Fellowship ($3000) for undergraduate students to work in summer 2005.

[G9] WPI Undergraduate Summer Research Fellowship ($3000) for undergraduate students to work in summer 2004.

JOURNAL PUBLICATIONS

[J1] Murali Mani, XML Views, Encyclopedia of Database Systems, (Invited Article), Tamer Ozsu, Ling Liu (Eds), 2009, (In Press)

[J2] *Mingzhu Wei*, Elke A. Rundensteiner, Murali Mani, Ming Li, Processing recursive XQuery over XML streams: The Raindrop approach. DKE 65(2): 243-265, 2008

[J3] *Song Wang*, Elke A. Rundensteiner, Murali Mani, Optimization of nested XQuery expressions with orderby clauses, Data and Knowledge Engineering, 60(2), 303 – 325, 2007

[J4] Murali Mani, *Song Wang*, Dan Dougherty, Elke Rundensteiner, Join Minimization in XML-to-SQL Translation: An Algebraic Approach, ACM SIGMOD Record, 35(1), 20 - 25, 2006

[J5] *Ling Wang*, Elke A. Rundensteiner, Murali Mani, Updating XML views published over relational databases: Towards the existence of a correct update mapping, DKE, 58(3), 263 - 298, 2006

[J6] *Hong Su*, Elke A. Rundensteiner, Murali Mani, Automaton meets algebra: A hybrid paradigm for XML stream processing, DKE, 59(3), 576 - 602, 2006

[J7] Makoto Murata, Dongwon Lee, Murali Mani, Kohsuke Kawaguchi, Taxonomy of XML Schema Languages Using Formal Language Theory, ACM Transactions of Internet Technology (TOIT), 5(4), 660 - 704, 2005

[J8] Murali Mani, Antonio Badia, Semistructured Data and its Conceptual Models, Encyclopedia of Database Technologies and Applications, 607 - 612, 2005

[J9] Murali Mani, Understanding the Semantics of Sensor Data, ACM SIGMOD Record Special Issue on Sensor Data Management, 32(4), 28 - 34, 2003

[J10] Dongwon Lee, Murali Mani, Wesley W. Chu, Schema Conversion Methods between XML and Relational Models, Knowledge Transformations for the Semantic Web, (Invited Article), Vol. 95, 1 - 17, 2003

BOOK CHAPTERS

[BC1] *Mingzhu Wei, Ming Li*, Elke A. Rundensteiner, Murali Mani, Hong Su, XML Stream Processing: Current Technologies and Open Challenges, Book Chapter in Open and Novel Issues in XML Database Applications: Future Directions and Advanced Technologies, 2008

CONFERENCE AND WORKSHOP PUBLICATIONS

[C1] *Philip Hanson*, Murali Mani, Semantic Optimization of XQuery by Rewriting, International Workshop on Schema Languages for XML (XSchemas), Riga, Latvia, Sep 2009

[C2] *Jozsef Patvarczki*, Murali Mani, Neil Heffernan, Performance Driven Database Design for Scalable Web Applications, Conference on Advances in Databases and Information Systems (ADBIS), Riga, Latvia, Sep 2009

[C3] Bengisu Tulu, Murali Mani, *Erik Archambault, Konstantin Naryshkin,* Designing Personal Health Records for Parents of Infants: An Application Developed Using Google Health APIs, AMIA 2009 Annual Symposium (Poster), San Francisco, CA, Nov 2009

[C4] *Mingzhu Wei*, Elke A. Rundensteiner, Murali Mani, Utility-driven Load Shedding for XML Stream Processing, World Wide Web (WWW) Conference, Beijing, China, 2008, pages 865 - 874

[C5] *Ming Li*, Murali Mani, Elke A. Rundensteiner: Efficiently loading and processing XML streams, IDEAS 2008: 59-67

[C6] *Ling Wang, Ming Jiang*, Elke A. Rundensteiner, Murali Mani: An Optimized Two-Step Solution for Updating XML Views, DASFAA 2008: 19-34

[C7] *Ming Li*, Murali Mani, Elke A. Rundensteiner, Semantic Query Optimization for Processing XML

Streams with Minimized Memory Footprint, DataX Workshop (In association with EDBT, International Conference on Extending Database Technology), Nantes, France, 2008

[C8] *Hong Su*, Elke A. Rundensteiner, Murali Mani, Automation In or Out: Run-time Plan Optimization for XML Stream Processing, Scalable Stream Processing Systems (SSPS, In association with EDBT, International Conference on Extending Database Technology), Nantes, France, 2008

[C9] *Ming Jiang, Ling Wang*, Murali Mani, Elke A. Rundensteiner, Updating Views over Recursive XML, ICDT Workshop on Emerging Research Opportunities in Web Data Management (EROW), Jan 2007

[C10] *Ming Li, Mo Liu, Luping Ding*, Elke A. Rundensteiner, Murali Mani, Event Stream Processing with Out-of-Order Data Arrival, Workshop on Distributed Event Processing Systems and Applications (DEPSA), 2007

[C11] *Ling Wang*, Elke A. Rundensteiner, Murali Mani, Ming Jiang, HUX: a Schema-centric approach for updating XML views, ACM CIKM (poster), 816 - 817,Washington, D. C., Nov 2006

[C12] *Mingyu Feng*, Neil T. Heffernan, Murali Mani, Christina Heffernan, Using Mixed-Effects Modeling to Compare Different Grain-Sized Skill Models, In Beck, J., Aimeur, E., & Barnes, T. (Eds). Educational Data Mining: Papers from the AAAI Workshop, Menlo Park, California, AAAI Press. 57 - 66, 2006

[C13] *Ling Wang*, Elke A. Rundensteiner, Murali Mani, U-Filter: A Lightweight XML View Update Checker, International Conference on Data Engineering, ICDE (poster), 126, Atlanta, Georgia, Apr 2006

[C14] *Maged El-Sayed*, Elke A. Rundensteiner, Murali Mani, Incremental Maintenance of Materialized XQuery Views, International Conference on Data Engineering, ICDE (poster), 129, Atlanta, Georgia, Apr 2006

[C15] *Mingzhu Wei, Ming Li*, Elke A. Rundensteiner, Murali Mani, Processing Recursive XQuery over XML Streams: The Raindrop Approach, Workshop on XML Schema and Data Management (XSDM, in Conjunction with International Conference on Data Engineering, ICDE), Atlanta, Georgia, Apr 2006 (extended version appeared as J2)

[C16] *Hong Su*, Elke Rundensteiner, Murali Mani, Semantic Query Optimization for XQuery over XML Streams, International Conference on Very Large Databases (VLDB), Trondheim, Norway, Aug 2005

[C17] *Maged El-Sayed*, Elke Rundensteiner, Murali Mani, Incremental Fusion of XML Fragments through Semantic Identifiers, IDEAS, 369 - 378, Montreal, Canada, Jul 2005

[C18] *Song Wang*, Elke A. Rundensteiner, Murali Mani, Optimization of Nested XQuery Expressions with Orderby Clauses, Workshop on XML Schema and Data Management (XSDM, in Conjunction with ICDE), Tokyo, Japan, Apr 2005 (extended version appeared as J3)

[C19] Murali Mani, EReX: A Conceptual Model for XML, XML Database Symposium (XSym, Held in Conjunction with VLDB), Toronto, Canada, Aug 2004

[C20] *Aparna Varde*, Elke A. Rundensteiner, Murali Mani, Mohammed Maniruzzaman, Richard D. Sisson Jr, Semantic Extensions to Domain Specific Markup Languages, International Conference on Computing, Communications and Control Technologies, Austin, Texas, Aug 2004

[C21] Murali Mani, Dongwon Lee, XML to Relational Conversion Using Theory of Regular Tree Grammars, Workshop on Efficiency and Effectiveness of XML Tools, and Techniques (EEXTT, Held in Conjunction with VLDB), 2002, 81 - 103

[C22] Dongwon Lee, Murali Mani, Frank Chiu, Wesley W. Chu, NeT & CoT: Translating Relational Schemas to XML Schemas using Semantic Constraints, ACM CIKM, 282 - 291, 2002. (poster version published at VLDB 2002)

[C23] Murali Mani, Dongwon Lee, Richard R. Muntz, Semantic Data Modeling Using XML Schemas, ER Conference, 149 - 163, 2001

[C24] Dongwon Lee, Murali Mani, Frank Chiu, Wesley W. Chu, Nesting-Based Relational-to-XML Schema Translation, International Workshop on Web and Databases (WebDB, Held in conjunction with ACM SIGMOD), 61 - 66, 2001

[C25] Makoto Murata, Dongwon Lee, Murali Mani, Taxonomy of XML Schema Languages using Formal Language Theory, Extreme Markup Languages, 2001. (journal version appeared as J7, and an earlier version appeared as IBM Research Technical Report TR3)

[C26] Paul Castro, Murali Mani, Siddhartha Mathur, Richard R. Muntz, Managing Context for Internet Videoconferences: The Multimedia Internet Recorder and Archive, Proc. of Multimedia and Computer Networks, San Jose, California, 2000

[C27] Murali Mani, Neel Sundaresan, A Data Model and Query Language for XML, World Wide Web (WWW) Conference (poster), Amsterdam, Netherlands, May 2000

[C28] Dinesh Ajmera, Paul Castro, Ted Kremenek, Murali Mani, Richard R. Muntz, My Building Knows Where I am! Using Jini Technology As a Framework for Supporting Smart-Spaces, JavaOne, San Francisco, California, Jun 2000

System Demonstrations

[D1] *Ming Li*, Murali Mani, Elke A. Rundensteiner: Constraint-Aware XSLT Evaluation. ER 2008: 524-525s

[D2] *Ming Li*, Murali Mani, Elke A. Rundensteiner: ELF: A Constraint-Aware XQuery Engine for Processing XML Streams with Minimized Memory Footprint. ICSC 2008: 494-495

[D3] *Song Wang, Hong Su, Ming Li, Mingzhu Wei, Shoushen Yang, Drew Ditto*, Elke A. Rundensteiner, Murali Mani, R-SOX: Runtime Semantic Query Optimization over XML Streams, VLDB (demo), 1207 - 1210, Seoul, Korea, Sep 2006

[D4] *Ling Wang*, Elke A. Rundensteiner, Murali Mani, *Ming Jiang*, HUX: Handling Updates in XML, VLDB (demo), 1207 - 1210, Seoul, Korea, Sep 2006

[D5] *Hong Su*, Elke A. Rundensteiner, Murali Mani, Semantic Query Optimization in an Automata-Algebra Combined XQuery Engine over XML Streams, VLDB (demo), Toronto, Canada, Aug 2004

Lightly Reviewed Conference Publications

[LC1] Murali Mani, Constraint Specification for XML: A Closer Look, Extreme Markup Languages, Montreal, Canada, Aug 2004 (Late Breaking News Session)

[LC2] Murali Mani, Keeping chess alive: Do we need 1-unambiguous content models?, Extreme Markup Languages, Montreal, Canada, Aug 2001 (Late Breaking News Session)

Technical Reports

[TR1] *Yaobin Tang*, Murali Mani, Butterfly: A Provenance Management System, Computer Science Dept, WPI, Technical Report WPI-CS-TR-08-16, 2008

[TR2] *Joseph Lapointe*, Murali Mani, FSA Cost Comparison for XML Stream Processing, Computer Science Dept, WPI, Technical Report WPI-CS-TR-08-15, 2008

[TR3] Dongwon Lee, Murali Mani, Makoto Murata, Reasoning about XML Schema Languages using Formal Language Theory, IBM Research TR, RJ 10197 Log 95071, Nov 2000 (also appeared as C24,J7)

[TR4] Murali Mani, Neel Sundaresan, Query Processing Using QuiXote, IBM Research TR, RC 21680 Log

97690, Mar 2000 (also appeared as C26)

[TR5] Murali Mani, Richard R. Muntz, Broadcasting Issues in Video Servers, UCLA CSD TR, #990008, Mar 1999

[TR6] Alex Zelikovsky, Murali Mani, Gautam Bhatia, Andrew B. Kahng, Traversing Probabilistic Graphs,UCLA CSD TR, #990010, Mar 1999

PhD STUDENTS ADVISED

1. Ming Li, TOPIC: Robust Query Processing over Event Streams; Date of Completion: Jan 2010 (expected); Job Offer from IBM, Silicon Valley
2. Ling Wang (co-advised with Prof. Elke Rundensteiner), TOPIC: Updating XML Views; Date of Completion: Aug 2006; Currently working at IBM, Silicon Valley.
3. Hong Su (co-advised with Prof. Elke Rundensteiner), TOPIC: AutomatonMeets Algebra: A Hybrid Paradigm for Efficiently Processing XQuery over XML Streams, Date of Completion: Dec 2005; Currently working at Oracle
4. Maged El-Sayed (co-advised with Prof. Elke Rundensteiner), TOPIC: Incremental Maintenance of Materialized XQuery Views, Date of Completion: Aug 2005; Currently working as a faculty in Egypt

MS STUDENTS ADVISED

1. Yaobin Tang, TOPIC: Provenance Metadata Management; Date of Completion: Mar 2009.
2. Di Wang, TOPIC: Query Processing Architectures in Data Integration Scenarios; Date of Completion: May 2009.
3. Ming Jiang, TOPIC: Updating Views over Recursive XML; Date of Completion: Dec 2007; Currently working at IBM, Massachusetts
4. Ming Li, TOPIC: Semantic Query Optimization for Processing XML Streams with Minimized Memory Footprint; Date of Completion: Sep 2007; Currently near completion of his PhD
5. Trupti Sanikop, TOPIC for MS project: XML View Maintenance; Date of Completion: Jan 2009
6. Sowmya Karunakaran, TOPIC for MS project: Streaming XPath Processing with Forward and Backward Axes; Date of Completion: Dec 2005
7. Rekha Rani, TOPIC for MS project: View Maintenance Involving Aggregate Operators; Date of Completion: May 2007

UNDERGRADUATE STUDENTS ADVISED FOR RESEARCH

1. Philip Hanson (Sep 2008 – May 2009): Worked on XPath query optimization using semantic constraints [C1], and on view maintenance.
2. Berk Birand (Aug 2007 – May 2008): Worked on XPath query optimization.
3. Andrei Vasilescu (Jun 2005 – May 2007): Worked on translating relational view updates by examining data. Publication [PS2] under submission.

Undergraduate Students Advised for Senior Thesis

Konstantin Naryshkin, Erik Archambault, Kaushal Shreshta, Mandela Kiran, Muhammad Azeem, Rohit Jagani, Alin Sirbu, Andrei Vasilescu, Drew Ditto, Niva Shreshtha, Greb Labonte, Aaron McDewitt, Nikhil Sreenath, Jennifer Schweers, Jared Runes, Rich Omar, Rich Tamalavitch, Min Song, Jinho Kang, Rich Nordin

TEACHING

Teaching Innovations and Courses Taught

I have taught courses in Database Systems, as well as courses outside Database Systems. At WPI, the basic courses I have taught include graduate database course (CS542: Database Management Systems), undergraduate Database courses (CS3431: Database Systems I; CS4432: Database Systems II), undergraduate Algorithms course (CS2223: Algorithms). Besides this, I introduced an advanced database course for graduate students that has been made permanent (CS556: Foundational Aspects of Database Systems). I also taught a graduate-level seminar course on databases and the web, and covered lectures for other faculty members, on the topics of automata theory, algorithms, operating systems and software engineering.

While I was a graduate student at UCLA, I was a teaching assistant for about 15 months, in courses that covered algorithms and operating systems. During my undergraduate studies at IIT, Madras, India, I was a TA for introductory computer science course, as well as for operations research.

New Courses Introduced at WPI

I introduced an advanced database course at WPI (CS556: Foundational Aspects of Database Systems) and worked to make it a permanent course. The motivation behind this course was to strengthen the database research at WPI, and because we observed that students often shy away from reading papers related to database theory. I have taught this course twice, once as an experimental course in Fall 2005 and once after it became a permanent course in Spring 2009. Besides the above course, I have also taught a graduate level seminar course on databases and the web in Fall 2004.

SERVICE

Service to Community

Information Chair, ACM SIGMOD 2009

Program Committee Member: ICDM 2009; ACM CIKM 2007 – 2009; ACM CIKM PhD Workshop 2007; ER Conference; ODBASE Conference; WIDM, WISE, XSDM Workshop (held in conjunction with ICDE), XSym (Held in conjunction with VLDB), PDMST (P2P Data Management, Security and Trust), ICDCIT (International Conference on Distributed Computing and Internet Technology) , XANTEC (International Workshop on XML Data Management Tools and Techniques)

Referee: ACM TODS, VLDB Journal, ACM TOIT, ACM TOIS, IPL (Information Processing Letters), Information Systems, DKE, AIEDAM

NSF Panel Member: Nov 2003, Jun 2004, Jun 2006, Jan 2008, Feb 2009

Organization of Colloquia: NEDS (New England Database Seminar) with Prof. Michael Kifer (Feb 11, 2005); Computer Science Department, WPI Colloquia with Prof. Bruce Croft (Apr 2008), Donghui Zhang (Apr 2006), Sanjay Madria (Apr 2005), Michael Kifer (Feb 2005), Michael Sperberg McQueen (Fall 2004), David Booth (Spring 2004)

Research Group Initiatives: Member of DSRG (Database Systems Research Group), WPI with Prof. Elke Rundensteiner; Started dbUCLA (now called idmUCLA) in 2001 with Dongwon Lee and other database research students at UCLA

SERVICE TO WPI

Advisor for Freshmen Class, 2008-09 (Recognized by advisees as the second best advisor from about 40 faculty advisors)

CS Minor Advisor, 2008-09

Elected Member of WPI Campus Wide Committees: CAO (2007-09); UOAC (2006 – 09). Also served as secretary of CAO from 2008-09.

Elected Member of Computer Science Dept, WPI Promotions Committee, 2008-09

Member of several CS Dept committees: Graduate and Research Committee; Graduate Admissions Committee; Undergraduate and Education Committee; Colloquium Committee; Undergraduate Council.

REFERENCES

Available upon request.