

## Li (Lily) CHEN

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### RESEARCH INTERESTS

XML query processing, containment and rewriting, view maintenance, data integration, data mining, cache management, E-Commerce, and multi-dimensional data indexing.

### EDUCATION

- **Ph.D. in Computer Science** (1997 - 2003) Worcester Polytechnic Institute (WPI), Worcester, MA  
*Advisor:* Prof. Elke A. Rundensteiner  
*Dissertation:* Semantic Caching for XML Queries
- **M.S. in Computer Science** (1994 - 1997) Beijing University of Posts and Telecom., Beijing, China  
*Advisor:* Prof. Bo Ai  
*Thesis:* An Integrated Environment for Telecommunication Services over TINA
- **B.S. in Computer Science** (1990 - 1994) Beijing University of Posts and Telecom., Beijing, China  
*Qualifying project:* Database Management Issues in TEPOS (TEst of Progress suppOrting System)

### HONORS

- IBM Cooperative Fellowship, 1998 - 2002
- Ericsson's Certification of Excellency in Performance and Prompt Software Delivery, 1996
- Honor Title of "Excellent Student", Beijing University of Posts and Telecom., 1996
- Merit Scholarship, Beijing University of Posts and Telecom., every semester, 1990 - 1996
- Second Prize in the Provincial Olympic Physics Contest for High School Students, 1989
- Third Prize in the Provincial Olympic Physics Contest for High School Students, 1988

### PUBLICATIONS

#### Journal Papers

- [1] Chen, L., Wang, S. and Rundensteiner, E. A. "Evaluation of Replacement Strategies for XML Query Cache", *Data and Knowledge Engineering (DKE) Journal*, 2003, to appear.
- [2] Chen, L., Choubey, R. and Rundensteiner, E. A. "Merging R-Trees: Efficient Strategies for Local Bulk Insertion", *GeoInformatica Journal*, 2002, Volume 6, Issue 1, pp. 7-34.
- [3] Chen, L., Claypool, K. and Rundensteiner, E. A. "SERFing the Web: The Re-Web Approach for Web Re-Structuring", *World Wide Web Journal - Special Issue on "Internet Data Management"*, 2000, Volume 3, Issue 2, pp. 95-109.

## Conference Papers

- [1] Chen, L., Wang, S. and Rundensteiner, E. A. “A Fine-Grained Replacement Strategy for XML Query Cache”, *ACM Intl. Workshop on Web Information and Data Management (WIDM)*, McLean, Virginia, November 2002, pp. 76–83.
- [2] Chen, L. and Rundensteiner, E. A. “A Query Containment and Rewriting Framework for XQuery”, *ACM SIGMOD Associated Workshop on the Web and Databases (WebDB)*, Madison, Wisconsin, June 2002, pp. 31–36.
- [3] Chen, L., Rundensteiner, E. A. and Wang, S. “ACE-XQ - A Semantic Caching System for XML Queries”, *ACM SIGMOD, Software System Demonstration Paper*, Madison, Wisconsin, June 2002, pp. 618.
- [4] Chen, L., Rundensteiner, E. A., Ally, A., Chen, R. and Kou, W. “Active Page Generation via Customizing XML for Data Beans in E-Commerce Applications”, *Intl. Symp. on E-Commerce (ISEC)*, Hong Kong, April 2001, pp. 79–97.
- [5] Su, H., Kramer, D., Chen, L., Claypool, K. and Rundensteiner, E. A. “XEM: Managing the Evolution of XML Documents”, *Intl. Workshop on Research Issues in Data Engineering (RIDE)*, Heidelberg, Germany, April 2001, pp. 103–110.
- [6] Chen, L. and Rundensteiner, E. A. “Aggregate Path Index for Incremental Web View Maintenance”, *Intl. Workshop on Advanced Issues of E-Commerce and Web-based Information Systems (WECWIS)*, San Jose, California, June 2000, pp. 231–238.
- [7] Quan, L. P., Chen, L. and Rundensteiner, E. A. “Argos: Efficient Refresh in an XQL-Based Web Caching System”, *ACM SIGMOD Associated Workshop on the Web and Databases (WebDB)*, Dallas, Texas, May 2000, pp. 78–91.
- [8] Rundensteiner, E. A., Claypool, K., Chen, L., Su, H. and Oenoki, K. “SERFing the Web: Web-Site Management Made Easy”, *ACM SIGMOD, Software System Demonstration Paper*, Dallas, Texas, May 2000, pp. 585.
- [9] Claypool, K., Chen, L. and Rundensteiner, E. A. “Personal Views for Web Catalogs”, *IEEE Data Engineering Bulletin, Special Issue: Database Technology for E-Commerce*, March 2000, pp. 10–16.
- [10] Choubey, R., Chen, L. and Rundensteiner, E. A. “GBI: A Generalized R-Tree Bulk-Insertion Strategy”, *Intl. Symp. on Spatial Databases (SSD)*, Hong Kong, July 1999, pp. 91–108.
- [11] Rundensteiner, E. A., Claypool, K., Chen, L. and Zhang, X. “SERF: ODMG-Based Generic Restructuring Facility”, *ACM SIGMOD, Software System Demonstration Paper*, Philadelphia, Pennsylvania, May 1999, pp. 568–570.
- [12] Claypool, K., Rundensteiner, E. A. and Chen, L. “Re-WEB: Re-Usable Templates for Web View Generation and Restructuring”, *IBM Center for Advanced Studies Conference (CASCON)*, Toronto, Canada, November 1998.
- [13] Claypool, K., Rundensteiner, E. A., Chen, L. and Kothari, B. “Re-usable ODMG-based Templates for Web View Generation and Restructuring”, *CIKM Workshop on Web Information and Data Management (WIDM)*, Washington, D.C., November 1998, pp. 53–56.

- [14] Chen, L., Choubey, R. and Rundensteiner, E. A. “STLT: Bulk Insertion into R-trees”, *ACM Workshop Geographic Information Systems (ACM-GIS)*, Washington, D.C., November 1998, pp. 161–162.
- [15] Chen, L. and Ai, B. “An Engineering View of ODP in Telecommunication Information Networking Architecture”, *Intl. Conf. on Information Infrastructures*, Beijing, China, April 1996, pp. 334–341.

### Papers In Submission

- [1] Chen, L. and Rundensteiner, E. A. “Variable-based Containment Mapping for XQuery”, Submitted to EDBT 2004.
- [2] Chen, L. and Rundensteiner, E. A. “Experimental Evaluation of Web View Maintenance Strategies”, In preparation.

### RESEARCH EXPERIENCE

**Research Assistant (1997 - 2003)** (with IBM Fellowship 1998 - 2001) WPI Worcester, MA

- **XML Query Cache.** Researched and developed a semantic caching system for XML queries based on the query containment and rewriting techniques to achieve the goal of improving the performance of XML query evaluation in a distributed environment. Designed, implemented, tested and maintained this caching system named “ACE-XQ” (A CachE-aware XQuery answering system). Developed query normalization rules and minimization techniques. First proposed and implemented the XQuery containment checking and rewriting framework, which handles containment beyond XPath (on which the extensive research has been focused). Proposed and implemented a fine-grained replacement strategy which can better adapt to the user access pattern. Conducted experimental studies to illustrate the performance gains over the alternative replacement policies. Demonstrated the system at SIGMOD’02. Published one journal paper and two conference papers.
- **Web Information Integration and Its Maintenance.** Conducted research and development of a web view maintenance system called “ARGOS” for efficiently maintaining the integrated web information. Designed a novel index structure and developed a maintenance strategy that can enhance the self-maintainability and hence the view refreshing efficiency. Published two conference papers.
- **OODB Schema Evolution and Its Application in Web Site Restructuring Management.** Designed and implemented a web site restructuring services called “ReWEB” over “SERF” (Schema Evolution through an extensible, Re-usable and flexible Framework). Developed an OODB-XML model mapping strategy. Utilized SERF to provide the object-oriented schema and view evolution support for managing the restructuring of web sites such as the personalized catalogs for E-Commerce. Published one journal paper and four conference papers. Demonstrated the system twice at SIGMOD.
- **Multi-dimensional Data Indexing.** Investigated a bulk-insertion strategy called “STLT” for dynamically maintaining the R-tree index in a spatial database system such as GIS (Geographic Information System). Implemented this technique and conducted experimental studies to demonstrate the improvement of database availability. Published one journal paper and two conference papers.

### TEACHING EXPERIENCE

**Part-time Instructor (2002 - 2003)** WPI Worcester, MA

- Taught two undergraduate database courses. Handled 100 students in total and had full responsibilities in managing the class. Prepared lecture notes, gave lectures, held lab and office hours, designed homeworks, projects and exams, maintained on-line discussion board and coordinated five TAs. Got high evaluations from the students and was praised for giving one of the best lectures they had ever had at WPI.
- Aided the teaching of an advanced database course at the graduate student level. Helped hold the labs.

**Student Mentor (1998 - 2002)**

WPI Worcester, MA

- Supervised six undergraduate students to conduct their major qualifying projects (three of whom obtained the Awards of Outstanding Projects). Supervised three master students in their thesis work.

**INDUSTRY EXPERIENCE**

**Summer Intern (1998 - 2000)**

IBM Toronto Lab Toronto, Canada

- **Developer of the IBM E-Commerce Solution - Websphere Commerce Suite (WCS V5).** Contributed in the development of the back-end integration of WCS V5. Implemented the view composition template for creating XML messages, and the functions for parsing messages and routing them to different transports. Investigated feasible solutions for generating web pages from the XML response messages. Developed a prototype that adopts the approach of exporting DataBeans to XML documents and then transforming XML into HTML pages using XSLT. This approach for automatic page generation helps to relieve programmers from the burden of coding the composition logic using JSP for each new bean type and hence provides a more scalable solution. Published one paper at International Symposium on Electronic Commerce (ISEC'01). Researched the E-Commerce Intelligence for measuring, analyzing and reporting the effectiveness of online stores.
- **Developer of the IBM XML Query Engine Prototype.** Conducted research and development of a flexible execution engine translating the surface query language into intermediate languages appropriate for the XML storage formats in parsed DOM, relational tables, LDAP directory objects, etc.
- **Tester of the IBM Net.Commerce.** Wrote scripts for generating transaction data. Revised the E-R design for Net.Data. Populated the sample data into DB2 to build virtual stores. Evaluated the system capacity and performance. Reviewed the TCP-W proposal.

**Software Engineer (1994 - 1996)**

Ericsson Inc. Beijing, China

- **Chief Developer of TEPOS (TEst Progress suppOrt System).** Designed and implemented the kernel database module for TEPOS, a tool for progress reporting during testing. Led the requirement analysis and the design of user interface for test case registration, metrics data collection and feedback retrieval. Wrote an SGML parser for parsing test documents and extracting useful information to be inserted into a database. Created the TEPOS database schema and indexes in Sybase. Implemented triggers for maintaining database integrity and stored procedures for transaction management. Defined the user access rights for sensitive data and set view limitations to people at different levels in the organization. Exploited the caching mechanism for performance tuning. Approximately 2000 Ericsson users today use TEPOS, the quality of which is appraised as excellent.

## COMPUTER SKILLS

- **Programming Languages and Query Languages**  
Java, C++, C, ML, Perl, PHP, JSP, SQL, JDBC, Java Servlet, OQL, XML, XQL, XSLT, and XQuery.
- **Operating Systems**  
Unix (Linux) and Windows (95, 98, NT, 2000, XP).
- **Applications and Software Packages**  
Latex, MS Office, JBuilder, IBM Websphere Application Server, IBM VisualAge Enterprise Edition for Java, IBM MQ Series, EJB, Oracle, Together ControlCenter, JavaCC, JTB, CVS, SAS, and Mat-Lab.

## PROFESSIONAL INVOLVEMENT

- **Member** of ACM (1999 - present) and IEEE (2001 - present).
- **External Referee** for CASCON'00 and SSD'99. **Conference Paper Reviewer** for SIGMOD'03, VLDBJ'02, VLDB'02, SSD'01, VLDB'00, VLDB'99, CIKM'99, and SIGMOD'98, etc. **Technical Reviewer** for the book *Early Adopter for XQuery* published by Wrox Press.
- **Attendee** of SIGMOD'03, WIDM'02, SIGMOD'02, WEBDB'02, ISEC'01, SIGMOD'00, WEBDB'00, WECWIS'00, CASCON'00, ISEC'00, SIGMOD'99, SSD'99, VLDB'98, CASCON'98, CIKM'98, and GIS'98. **System Demonstration Presenter** at SIGMOD'02, SIGMOD'00, CASCON'00, SIGMOD'99, and CASCON'98. **Paper Presenter** at WIDM'02, WEBDB'02, ISEC'01, WEBDB'00, WECWIS'00, SSD'99, GIS'98, and ICII'96.

## EXTRA-CURRICULAR ACTIVITIES

- **Vice-President** of the Chinese Students and Scholars Association (CSSA) at Worcester Polytechnic Institute, 1998 - 2000.
- **Vice-President** of Students Activity Organization, organized by the Department of Computer Science, Beijing University of Posts and Telecom., 1994 - 1996.

## REFERENCES

**Professor Elke Rundensteiner**  
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