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Education

COLUMBIA UNIVERSITY — New York, New York
Ph.D. in Computer Science, August 1997 (expected).

COLUMBIA UNIVERSITY — New York, New York
M.S. in Computer Science, May 1990.

KEIO UNIVERSITY — Yokohama, Japan
M.S. in Administration Engineering, March 1981.

KEIO UNIVERSITY — Yokohama, Japan
B.S. in Administration Engineering, March 1979.

Dissertation

Implementation Techniques for Materialized Views: My work focuses on how to efficiently implement materialized views in a database system. Such a system physically stores the view (i.e., derived data) on disk to speed-up queries over the view, and performs view maintenance incrementally to reestablish view consistency whenever the underlying data of the view is modified. This work developed a number of key techniques for minimizing the overhead of maintaining the auxiliary information required for view maintenance and for supporting serializability guarantees to transactions running in the presence of materialized views. The results include performance studies based on an actual implementation on Ode, a publicly available object-oriented database system.

Research Experiences

COLUMBIA UNIVERSITY — New York, New York
September 1992—Present (Graduate Research Assistant)
Adviser: Kenneth A. Ross (from 1993 Fall) and Calton Pu (until 1993 Summer). Conducting research in the area of database and transaction processing systems. Project work includes implementation and performance measurement of the Data-reduction Paradigm (in collaboration with University of Illinois at Chicago) and Epsilon Serializability (in collaboration with IBM Watson Research Center and Oregon Graduate Institute). Currently writing a dissertation on the topic of Materialized Views.

BELL LABORATORIES — Murray Hill, New Jersey
November 1994—Present (Consultant)
Working as a research consultant in the database research department. Duties include experimental system development and weekly progress/problem feedback.

LUCENT TECHNOLOGIES, INC. — Murray Hill, New Jersey
May 1996—September 1996 (Summer Employee)
Supervisor: Daniel F. Lieuwen and Inderpal S. Mumick. Experimental development and performance measurement of a complete view maintenance system featured with multiple maintenance policies (in collaboration with AT&T Laboratories).

AT&T BELL LABORATORIES — Murray Hill, New Jersey
May 1995—September 1995 (Summer Employee)
Supervisor: Inderpal S. Mumick. Development of the SWORD (System With Objects,

Relations and Declarativeness) interface to the ODE (Object Development Environment) database system. We identified the concurrency control problem in systems supporting materialized views, and developed a serializability theory based upon conflicts and serialization graphs. The patentability of our work is currently being examined by company patent attorneys.

MITSUBISHI HEAVY INDUSTRIES, LTD — Tokyo, Japan
April 1981—August 1993 (Assistant Manager)

Overall maintenance of IBM System/370 operating systems and IMS and DB2 application development support. Responsibilities included employee education and network management. Produced three annual award-winning IBM Guide/Share documents on DB2 recovery methodology (1984–1986, annual award was given to two out of forty-three documents). Joined a corporate planning group to upgrade large-scale information systems. Received fellowship during 1988—1990 (tuition, housing, and salary support for the graduate studies in the U.S.).

KEIO UNIVERSITY — Yokohama, Japan
April 1979—March 1981 (Graduate Research Assistant)

Adviser: Shoji Ura. Architectural design, development and performance analysis of APOS (Advanced Patient-oriented Pharmacy System), one of the first computer systems applied to the community pharmacy to warn of adverse drug-interaction effects.

Teaching Experiences

Instructor of Data Structures and Algorithms at Columbia University (Summer 1997).

Teaching Assistant at Columbia University for 10 graduate/undergraduate classes, in the course of which I taught dozens of sessions: Digital Computer System Design I, II (Fall 1994, Fall 1993, Spring 1992, Fall 1990), Database Systems (Fall 1994, Fall 1993), Discrete Mathematics (Fall 1992), Computer Network (Spring 1993), Introduction to C Programming Language (Summer 1994), Programming Languages and Translators (Fall 1991).

Publications

A. Kawaguchi, D. Lieuwen, I. Mumick, and K. Ross, Implementing Incremental View Maintenance in Nested Data Models, *To appear in the Sixth International Workshop on Database Programming Languages (DBPL), Colorado, August 1997.*

L. Colby, A. Kawaguchi, D. Lieuwen, I. Mumick, and K. Ross, Supporting Multiple View Maintenance Policies, *Proceedings of the 1997 International Conference on Management of Data (ACM/SIGMOD), Tucson, Arizona, May 1997, pp. 405–416.* Extended version available as Supporting Multiple View Maintenance Policies: Concepts, Algorithms, and Performance Analysis, *Bell Laboratories Technical Memorandum 112580-961029-09.*

A. Kawaguchi, D. Lieuwen, I. Mumick, D. Quass, and K. Ross, Concurrency Control for Materialized Views, *Proceedings of the Sixth International Conference on Database Theory (ICDT), Delphi, Greece, January 1997.* In *Afrati/Kolaitis, Editors, Lecture Notes in Computer Science (LNCS) Vol. 1186, Springer-Verlag, pp. 306–320.* Extended version available as Concurrency Control Theory for Deferred Materialized Views, *Bell Laboratories Technical Memorandum 112580-961008-07.*

A. Kawaguchi, D. Lieuwen, I. Mumick, and K. Ross, View Maintenance in Nested Data Models, *ACM/SIGMOD International Workshop on Materialized Views: Techniques and Applications, Montreal, Canada, June 1996, pp. 72–83.*

L. Colby, A. Kawaguchi, D. Lieuwen, I. Mumick, and K. Ross, Implementing Materialized Views, *Bell Laboratories Technical Memorandum 112580-951218-12.*

A. Kawaguchi, K. Mok, C. Pu, K. Wu, and P. Yu, Comparative Study of Divergence Control Algorithms, *IBM Research Report RC19564(85047)* and *Technical Report CUCS-013-94, Department of Computer Science, Columbia University.*

O. Wolfson, W. Zhang, H. Butani, A. Kawaguchi, and K. Mok, Parallel Processing of Graph Reachability in Databases, *International Journal of Parallel Programming (IJPP), Vol. 21(4), August 1993, pp. 269–302.*

O. Wolfson, W. Zhang, H. Butani, A. Kawaguchi, and K. Mok, A Methodology for Evaluating Parallel Graph Algorithms and Its Application to Single Source Reachability, *Proceedings of the Second International Conference on Parallel and Distributed Information Systems (PDIS), San Diego, CA, January 1993, pp. 243–250.*

A. Kawaguchi, Study on Drug Information Systems, *Master's Thesis, Keio University, Yokohama, Japan. March 1981.*

S. Ura, A. Kawaguchi, *et al*, Advanced Patient–oriented Pharmacy System (APOS), *MEDINFO80, Lindberg/Kaihara, Editors, IFIP, North–Holland, Tokyo, Japan, October 1980, pp. 924–931.*

Invited Talks

Department of Computer Science, The City University of New York (June 1997).

Department of Computer and Information Sciences, Kansas State University (March 1997).

Database Research Department, Bell Laboratories (May 1997, December 1996, and May 1996).

Mitsubishi Denki Study Group (April 1993).

Other Services

Arranged lectures for the Mitsubishi companies. Also worked as a translator for these lectures:

- Mitsubishi Computer and Communication Study Group (November 1996 in Columbia and IBM, November 1995 in Columbia and Bell Laboratories, November 1994 in Columbia and Oregon Graduate Institute, August and April 1994 in Tokyo Japan, November 1993 in Columbia and IBM, May 1993 in Tokyo Japan, November 1992 in Columbia).
- Mitsubishi Heavy Industries (August 1994 and May 1993 in Tokyo and Kobe Japan).
- Mitsubishi Electric Co. (April 1994 in Kamakura Japan).
- SRA Inc. (August 1994 in Tokyo Japan).
- Mitsubishi Motor Co. (May 1993 in Tokyo Japan).

Similar lecture arrangements to the universities in Japan:

- Kansei-Gakuin University (August 1994 in Kobe Japan with Kenneth A. Ross).
- Keio University (May 1993 in Yokohama Japan with Calton Pu).

Languages

English and Japanese.

Citizenship

Japanese (holding F-1 visa).