

Curriculum Vitae  
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## 1 Education and Work Experience

### 1.1 Education

- Ph.D. in Computer Sciences, **Univ. of Wisconsin**, Madison, Wisconsin, U.S.A., December 1985.
- M.Sc. in Computer Sciences, **Univ. of Wisconsin**, Madison, Wisconsin, U.S.A., May 1981.
- B.Sc. (equivalent) in Information Science, **Univ. of Science and Technology of China**, Beijing, China, August 1979.

### 1.2 Work Experience

- Endowed University Professor, (September 1999—August 2004), School of Computing Science, **Simon Fraser Univ.**, B.C., Canada.
- Research Director, (January 1997—present), **DBMiner Technology Inc.**, B.C., Canada.
- Professor, (September 1995—present), School of Computing Science, **Simon Fraser Univ.**, B.C., Canada (*promoted to Full Professor in September 1995*).
- Senior Industrial Research Fellow, (May. 1993—April 1994), **MPR (Micro-Pacific Research) Teltech Ltd.**, B.C., Canada (supported by NSERC Senior Industrial Fellowship).
- Associate Professor, (September 1991—August 1995), School of Computing Science, **Simon Fraser Univ.**, B.C., Canada, (*tenure received in June 1991, promoted to Associate Professor in September 1991*).
- Assistant Professor, (August 1987—August 1991), School of Computing Science, **Simon Fraser Univ.**, B.C., Canada.
- Assistant Professor, (January 1986—July 1987), Department of Electrical Engineering and Computer Science, **Northwestern Univ.**, Evanston, Illinois, U.S.A. (left due to visa expiration).

- Graduate Assistant, (August 1981—December 1985), Department of Computer Sciences, **Univ. of Wisconsin**, Madison, Wisconsin, U.S.A.

## 2 Awards and Honors

- Nominated for **2000 Excellence in Teaching Award** by Simon Fraser University.
- Appointed as an **Endowed University Professor** by Simon Fraser University, one of six Endowed University Professorships in the University (1999—2004).
- **ACM Service Award** for the service as tutorial chairman for *ACM SIGKDD 1999 International Conference on Knowledge Discovery and Data Mining*, 1999.
- Listed in **Who's Who in the World**, 11th–18th editions (1994/1995, 1995/1996, 1996/1997, 1997/1998, 1998/1999, 1999/2000, 2000/2001, 2001/2002). *Marquis Who's Who, A Reed Reference Publishing Company*.
- Listed in **Who's Who in Science and Engineering**, 2nd–6th edition (1994/1995, 1996/1997, 1998/1999, 2000/2001, 2002/2003), *Marquis Who's Who, A Reed Reference Publishing Company*.
- Listed in **Who's Who in the West**, 24th–28th edition (1994/1995, 1996/1997, 1998/1999, 2000/2001, 2001/2002). *Marquis Who's Who, A Reed Reference Publishing Company*.
- Listed in **Men of Achievement**, 16th edition, *International Biographic Centre*, Cambridge, England, 1994.
- Listed in **International Who's Who of Contemporary Achievement: Hall of Fame**, *American Biographical Institute, Inc.*, U.S.A., 1995.
- Listed in **International Who's Who of Contemporary Achievement**, *American Biographical Institute, Inc.*, U.S.A., 1994.
- Co-recipient of the **excellent paper award** of the *8th Annual Conf. of Japan Society of Artificial Intelligence*, Tokyo, Japan, June 1994.
- Co-recipient of the **distinguished paper award** of the *1st Int. Symp. on Artificial Intelligence*, Monterrey, Mexico, October 1988.
- The **best student paper award** (K.S. Fu award, IEEE) of the *2nd Int. Conf. on Data Engineering*, Los Angeles, February 1986.

## 3 Major Research and Professional Achievements

### 3.1 General Research Interests

- Database systems, knowledge-base systems, data mining (knowledge discovery in databases), data warehousing, spatial databases and spatial data mining, multimedia databases and multimedia data mining, Web database and Web mining, bio-informatics and DNA data mining, database applications, deductive and object-oriented databases, logic programming, and artificial intelligence.

### 3.2 Major Research and Professional Achievements

- Data mining and data warehousing:

**Major research contributions:** With my students and colleagues, we have developed a set of scalable data mining methods, including attributed-oriented induction [KDD'89, VLDB'92, IEEE TKDE'93, *Data and Knowledge Engineering*'98], OLAP mining methodology [SIGMOD Record'98], constraint-based, multi-level, multi-dimensional association mining [VLDB'95, ACM-SIGMOD'98, ACM-SIGMOD'99, COMPUTER'99, KDD'00], frequent pattern mining without candidate generation [ACM-SIGMOD'00, DMKD'00], time series mining [KDD'98, ICDE'99], and efficient sequential pattern mining algorithms [KDD'00, ICDE'01]. Also, I am the first and main author of a popular (probably the first) senior and/or graduate-level textbook on data mining [*Morgan Kaufmann*'00].

**Impact:** I am one of the pioneers in the field, served or have been serving as ACM SIGKDD supervisory committee member (1998—present), ACM SIGKDD Award Committee Chairman (1998—1999), program committee co-chairman of 2nd Int. Conf. on Knowledge Discovery and Data Mining (KDD'96), tutorial chairman of 1999 Int. Conf. on Knowledge Discovery and Data Mining (KDD'99), demo and exhibit committee chairman of 2000 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD'00), program committee co-chairman of 1st (2001) SIAM Int. Conf. on Data Mining (SIAM-DM'01), best paper award committee chairman of 2001 Int. Conf. on Knowledge Discovery and Data Mining (KDD'01), and so on. I am the chief architect of **DBMiner** system, an invited speaker or tutor in many international conferences, journal subject/associate editor for three major journals in the field, principal investigator or project leader for the research projects or industry contracts from Canadian NSERC, Canadian Networks of Centres of Excellence, B.C. Science Council, Alberta Research Council, Boeing, HP Lab, IBM Canada, London Drugs, Tamden Computers, Hughes Research Lab., MPR Teltech, etc.

- **Spatial data mining:**

**Major research contributions:** I am one of the early researchers on spatial data mining and have developed a set of efficient spatial mining methods, including spatial clustering [VLDB'94] and constrained spatial clustering [PAKDD'00, ICDT'01, ICDE'01], spatial data cube aggregation and computation [PAKDD'98, SSD'99, IEEE TKDE'00], a progressive deepening method for spatial association mining [SSD'95], and association-based spatial classification (in preparation).

**Impact:** I am the chief architect of the **GeoMiner** system [ACM-SIGMOD'97 demo], co-leader for the project “Discovering Geographic Knowledge in Data-Rich Environments” (1999—) sponsored by U.S. National Center for Geographic Information and Analysis (NCGIA), and co-editor of the research book, “*Geographic Data Mining and Knowledge Discovery*,” [Taylor and Francis, 2001]. Also, I gave a conference tutorial on spatial data mining for SSD'97, and served as a PC member for several international conferences and workshops on the theme.

- **Web data warehousing and Web mining:**

**Major research contributions:** We have developed some efficient Weblog mining methods [ADL'98, PAKDD'00] and a multi-layered database model for Web mining [KDD'95, WIDM'98].

**Impact:** I am the project leader of Canada Networks of Centres of Excellence, IRIS-3: “Building, Querying, Analyzing, and Mining Data Warehouses on the Internet” (1998—2002), working with IBM Canada, and chief designer of **WebLogMiner** and **WebMiner**. Also, I am an invited speaker and/or panelist on Web mining in IEEE ADL'98 and ACM SIGMOD'99, and served as a PC member for several international conferences and workshops on the theme.

- **Bio-informatics and DNA data mining.**

**Major research contributions:** Development of efficient DNA mining algorithms for finding DNA subsequences, sequence alignment, and gene function classification (prepared for SIGMOD'2001

demonstration).

**Impact:** We believe it is a highly efficient method. Its impact has to be seen in the years to come.

- **Multimedia data mining:**

**Major research contributions:** We have developed a multimedia frequent pattern analysis method [ICDE'00] and a multimedia synchronization method [IEEE Multimedia'94, ACM Journal of Multimedia Systems'94].

**Impact:** A chief designer of **MultiMediaMiner** [ACM-SIGMOD'98 demo], and served as a PC member for several international conferences and workshops on the theme.

- **Deductive and object-oriented databases:**

**Major research contributions:** We have developed interesting methods for deductive and recursive database compilation, chain-based and constraint-based deductive query evaluation methods [ACM-SIGMOD'87, ACM-SIGMOD'88, IEEE TKDE'89, IEEE TKDE'91, IEEE TKDE'94, IEEE TKDE'95, IS'98].

**Impact:** I have over 100 research papers published in this area, a chief architect of a deductive database system, **LogicBase** [ACM-SIGMOD'94 demo] (<http://db.cs.sfu.ca/LogicBase>), and served as a PC member for several international conferences and workshops on the theme.

### 3.3 Research Grants and Research Contracts Awarded

1. **NSERC (Natural Science and Engineering Research Council of Canada) equipment grant**, Project title: **A Scalable Web-Mining Server for Data Mining and Knowledge Discovery in the World-Wide Web**, principal investigator, \$64,515.00 (shared with Dr. Ke Wang) (April'2000).
2. **Science Council of British Columbia, G.R.E.A.T. award**, for my Ph.D. student Zhong Zhang, Project title: **Data Mining on the Internet**, \$20,000/yr for one year (September'00—August'01).
3. **Science Council of British Columbia**, Project title: **Retail Data Mining**, principal investigator, \$108,000 (Aug.'00—Aug.'01).
4. **Alberta Research Council**, Project title: **Data Mining in Oil Sand Refinery Database**, principal investigator, \$5,500 (May.'00—Aug.'00).
5. **Canada Networks of Centres of Excellence, TeleLearning-NCE Project Research Grant**, Project title: **Web Mining for Web-Activity Evaluation and Intelligent Restructuring of Web-Based Learning Environments**, principal investigator, \$16,500/yr (my portion) for one years (April'00—March'01).
6. **London Drugs Ltd.**, Project title: **Retail-Miner for London Drugs Retail Industry**, principal investigator, \$90,000 (Apr.'00—Apr.'01).
7. **HP Lab, Database Technology Department (U.S.A.) research contract**, Project title: **Data Mining for Web-based Business Intelligence Service**, principal investigator, \$65,000/yr (U.S.) for one year (January'00—December'00).
8. **NSERC (Natural Science and Engineering Research Council of Canada) operating grant**, Project title: **Data Mining in Data Warehouses, Advanced Database Systems, and World-Wide Web**, project leader and principal investigator, total \$576,000 for four years (my portion is \$38,850/yr for four years) (April'99—March'03).

9. **Boeing Aircraft Inc., (U.S.A.) research contract**, Project title: Data Mining for Boeing, principal investigator, \$42,000/yr (U.S.) (January'99—December'99).
10. **Canada Networks of Centres of Excellence, IRIS (Institute of Robotics and Intelligent Systems under administration of PRECARN Association) Project: IRIS3:HAN Research Grant**, Project title: Building, Querying, Analyzing, and Mining Data Warehouses on the Internet, project leader and principal investigator, \$56,000/yr for four years (April'98—March'2002).
11. **NSERC (Natural Science and Engineering Research Council of Canada) operating grant**, Project title: Intelligent Database Systems: Principles, Implementations and Applications, principal investigator, \$27,100/yr for four years (April'95—March'99).
12. **NSERC CRD (cooperative research and development) grant**, Project title: DBMiner: From Research Prototype to Market-Competitive Product, principal investigator, \$36,000/yr for two years (September'97—August'99).
13. **Canada Networks of Centres of Excellence (NCE), Geomatics Research Project (GEOID:Projects 1 & 2)**, “Cartographic Interface for Multi-Dimensional Exploration of Environmental, Health Indicators on the World-Wide Web”, \$42,000/yr for four years (March'99—March'02).
14. **Science Council of British Columbia, G.R.E.A.T. award**, for my Ph.D. student Eddie Kim, Project title: Data Mining and Intelligent Agent, \$17,000/yr for one year (September'98—August'99).
15. **HP Lab, Database Technology Department (U.S.A.) research grant**, Project title: SCOLAM: Scalable OLAP-mining for business intelligence applications, principal investigator, \$100,000/yr (U.S.) for one year (January'99—December'99).
16. **Boeing Aircraft Inc., (U.S.A.) research contract**, Project title: Data Mining for Boeing, principal investigator, \$12,000/yr (U.S.) (June'98—December'98).
17. **IBM Canada Pacific Development Center, (B.C. Canada) research grant**, Project title: Data mining and business intelligence, principal investigator, \$25,000/yr for three years (December'98—November'01).
18. **Seagate Software IMG (Vancouver, Canada) research grant**, Project title: Research on Data Mining and Data Warehousing, principal investigator, \$10,000/yr for one year (December'97—November'98).
19. **British Columbia Advanced Systems Institute, Strategic Initiative Research grant**, Project title: Enhancement of the DBMiner System for Data Mining in Large Relational Databases, principal investigator, \$45,000/yr for two years (May'97—April'99).
20. **Tandem Computers Inc. (U.S.A.) research grant**, Project title: Enhancement of Data Mining Performance by Parallel Processing, principal investigator, \$39,000/yr for one year (May'97—April'98).
21. **Canada Networks of Centres of Excellence, TeleLearning-NCE Project TL-3 Research Grant**, Project title: Multimedia Database and Knowledge-Base for Tele-Learning, principal investigator, \$15,000/yr (my portion) for four years (November'95—March'99).

22. **Hughes Research Laboratories (U.S.A.) research grant**, Project title: Knowledge discovery in multiple databases, principal investigator, \$27,200 for Dec.'94—Dec.'95 and \$20,000 for December'95—December'96.
23. **MPR Teltech Ltd., license fee converted to research grant**, Project title: Enhancement of the DBMiner System, principal investigator, \$18,750/yr for two years (January'96—June'97).
24. **MPR Teltech Ltd., Research-in-Aid**, Project title: Enhancement of the DBMiner System for Mining Knowledge in Relational Databases, principal investigator, \$20,000/yr for two years (January'96—June'97).
25. **Science Council of B.C., G.R.E.A.T. award**, for my Ph.D. student Kris Koperski, Project title: Spatial Data Mining, \$17,000/yr for one year (September'96—August'97).
26. **Science Council of B.C., G.R.E.A.T. award**, for my Ph.D. student Yongjian Fu, Project title: Relational Data Mining, \$17,000/yr for one year (September'95—August'96).
27. **Canada Networks of Centres of Excellence, IRIS (Institute of Robotics and Intelligent Systems under administration of PRECARN Association) Project: IRIS2:HMI-5 Research Grant**, Project title: Data Mining and Knowledge Discovery in Large Databases, project leader and principal investigator, \$150,449 (my portion) for four years (April'94—March'98).
28. **Canada Networks of Centres of Excellence, IRIS (Institute of Robotics and Intelligent Systems under administration of PRECARN Association) Project: IRIS2:IC-2 Research Grant**, Project title: A Knowledge-Based and Object-Oriented Spatial Database System for GIS applications, principal investigator, \$46,995 (my portion) for four years (April'94—March'98).
29. **NSERC Senior Industrial Fellowship**, for salary compensation of sabbatical leave in MPR Teltech Ltd, B.C., Canada (May'93—April'94).
30. **NSERC CRD (cooperative research and development) grant**, with Drs. Nick Cercone, Paul McFetridge and Fred Popowich, Project title: Executive Information Management Systems, principal investigator, \$225,000/yr for three years (December'92—December'95).
31. **SFU Centre for Systems Science strategic initiative grant**, with Dr. Nick Cercone, Project title: DBLearn—Knowledge Discovery in Large Databases, principal investigator, \$40,000/1st year, \$30,000/2nd year (May'92—April'94).
32. **Science Council of B.C., G.R.E.A.T. award**, for my Ph.D. student David James Gemmell, Project title: Real Time Multimedia Databases, \$17,000/yr for two years (May'92—April'94).
33. **NSERC operating grant**, Project title: Efficient Deduction, Induction and Query Processing Techniques for Data and Knowledge Bases, principal investigator, \$24,000/yr for three years (April'92—March'95).
34. **NSERC infrastructure grant**, with Drs. Veronica Dahl, Maarten van Emden, David Poole, et. al., Project title: Logic Programming Research Lab, \$11,544/yr for two years (April'92—March'94).
35. **SFU Centre for Systems Science strategic initiative grant**, with Dr. Wo-Shun Luk, B. Bhattacharya, T. Shermer and T. Poiker, Project title: G-Kernel: A geographic information system kernel, principal investigator, \$80,000/yr for 3 years (April'91—March'94).
36. **NSERC operating grant**, Project title: Knowledge Discovery and Applications in Deductive Database Systems, principal investigator, \$18,611/year for two years (April'90—March'92).

37. **NSERC equipment grant**, with Dr. Wo-Shun Luk, S. Atkins, Z. Li, and R. Krishnamurti, Project title: **Transputer-Based Multiprocessing System Upgrade**, \$52,860 in total (April'90—March'92).
38. **SFU Centre for Systems Science research grant**, with Dr. Wo-Shun Luk, Project title: **Design and Development of Large Spatial Databases**, principal investigator, \$37,000 in total (April'89—March'90).
39. **SFU Centre for Systems Science research grant**, Project title: **Extending Datalog for Practical Database Applications**, principal investigator, \$6,500 in total (April'89—March'90).
40. **SFU Centre for Systems Science research grant**, with Dr. Wo-Shun Luk, Project title: **Parallel Processing of Knowledge-Base Queries**, principal investigator, \$6,000 in total (Dec.'88—Nov.'89).
41. **SFU Centre for Systems Science research grant**, Project title: **A Deductive Entity-Relationship Data Model for Large Knowledge-Bases**, principal investigator, \$3,500 in total (June'88—May'89).
42. **SFU Centre for Systems Science research grant**, with Dr. Wo-Shun Luk, Project title: **Compilation and Query Processing in Logic Databases**, principal investigator, \$25,500 in total (June'88—May'89).
43. **NSERC operating grant**, Project title: **Complex Recursions and Functions in Knowledge-Based Systems**, principal investigator, \$17,000/yr for two years (April'88—March'90).
44. **SFU Centre for Systems Science research grant**, with Dr. Wo-Shun Luk, Project title: **A Performance Study of Transitive Closure Query Processing Algorithms**, principal investigator, \$6,000 in total (December'87—November'88).
45. **President's Research Grant of SFU**, Project title: **Compilation and Optimization of Recursive Queries in Deductive Database Systems**, principal investigator, \$3,600 in total (September'87—August'88).
46. **U.S. NSF (National Science Foundation) research grant DCR-86-08311**, Project title: **Logic and Database**, co-investigator, with Dr. Lawrence J. Henschen (principal investigator), U.S.\$289,647 in total for 3 years (1986—1989). (Note: My portion was terminated after my departure from U.S.A.).

### 3.4 Participation of Canadian National Research Networks

1. **Project leader and principal investigator**, Canada Networks of Centres of Excellence (NCE), IRIS/PRECARN Research Project (IRIS-3:HAN), for the project “**Building, Querying, Analyzing, and Mining Data Warehouses on the Internet**”, (April'1998—March'2002). (working with IBM Canada).
2. **Principal investigator**, Canada Networks of Centres of Excellence (NCE), Geomatics Research Project (GEOID:3), for the project “**Cartographic Interface for Multi-Dimensional Exploration of Environmental, Health Indicators on the World-Wide Web**”, (April'99—March'2003).
3. **Principal investigator**, Canada Networks of Centres of Excellence (NCE), TeleLearning-NCE Research Project (TLN:3), for the project “**Multimedia Database and Knowledge-Base for Tele-Learning**”, (Nov.'95—March'99).
4. **Project leader and principal investigator**, Canada Networks of Centres of Excellence (NCE), IRIS/PRECARN Research Project (IRIS-2:HMI5), for the project “**Data Mining and Knowledge Discovery in Large Databases**”, (April'94—March'98).

5. **Principal investigator**, Networks of Centres of Excellence (NCE), IRIS/PREARN Research Project (IRIS-2:IC2), for the project “A Knowledge-Based and Object-Oriented Spatial Database System for GIS applications”, (April’94—March’98). (working with MacDonald Dettwiler & Associates).

### 3.5 Industry collaborations and technology transfer

- The **DBMiner** data mining system. MPR Teltech Ltd. industry license (January 1996).
- The **DBMiner** data mining system. Technology transfer to DBTech Software Inc. (March 1997).
- Collaborations with industry:  
HP Lab (California, U.S.A.), Boeing Company (Seattle, Washington), London Drugs (Richmond, B.C., Canada), IBM Canada Pacific Development Centre (Burnaby, B.C., Canada), IBM Canada (Toronto, Ontario, Canada), Seagate Software (B.C., Canada), Tandem Computers Inc. (Austin, Texas), MacDonald Dettwiler & Associates (B.C., Canada), BC Biomedical Lab (B.C., Canada), BC Advanced Systems Institute (B.C., Canada), MPR Teltech Ltd. (B.C., Canada), Hughes Research Labs (Malibu, California).

## 4 Teaching, Student Supervision, University Service, and Professional Training

### 4.1 Teaching in Simon Fraser University and Northwestern University

- **Simon Fraser Univ. (1987—present):**

**Note:** Simon Fraser University was ranked No. 1 (followed by Univ. of Waterloo, etc.) among the comprehensive universities in Canada by Canadian’s news magazine **Macleans** in 1995, 1996, 1997, 1998, and 2000; and No. 2 (in parallel with Univ. of Waterloo) in 1999.

**Undergraduate level courses taught:** *CMPT-454: Database Systems II: An Advanced Course*, *CMPT-459: Special Topics on Database Systems* (various topics taught, including “*Data Mining and Data Warehousing*”, and “*Deductive and Object-Oriented Database Systems*”), *CMPT-354: An Introduction to Database Systems*, *CMPT-383: Concepts of Programming Languages*, and *CMPT-415: Independent Study on Database Systems*.

**Graduate level courses taught:** *CMPT-740: Database Systems*, *CMPT-843: Principles of Database and Knowledge-Base Systems*, *CMPT-884: Special Topics on Database Systems* (various topics taught, including “*Data Mining and Data Warehousing*”, and “*Deductive and Object-Oriented Database Systems*”), *CMPT-883: Special Topics on Artificial Intelligence*, and *CMPT-894: Independent Study on Database Systems*.

**Note:** My teaching in CS/SFU has been evaluated consistently as “*excellent*” or “*very good*”, and the class enrollments in my senior and graduate level courses have been kept at the top or close to the top regularly (for many years) among the same-level classes in the School of Computing Science, Simon Fraser University.

- **Northwestern Univ. (1986—1987):**

**Undergraduate level courses taught:** *Data Structures*.

**Graduate level courses taught:** *Advanced Database Systems*, *Expert Systems*, *Logic Programming*, and *Programming Languages*.

**Note:** My teaching in EECS, Northwestern was evaluated consistently as “*excellent*” or “*very good*”, and the class enrollments in my graduate level courses were kept at the top or close to the top among the same-level classes in the Department of EECS, Northwestern University.

## 4.2 Teaching Special Courses out of Campus

- Univ. of Pisa, Pisa, Italy (March 2001): *Data Mining Methods*
- Univ. of California at Los Angeles (scheduled for January 2002):  
UCLA Extension, Engineering and Computer Science Short Course, 2002: *Data Mining Techniques and Applications* (faculty representative: Carlo Zaniolo).
- Univ. of Antwerp, Antwerp, Belgium (April 1999): IBM Belgium sponsored IBM Chair Course: *Knowledge Discovery in Databases*.
- Univ. of California at Los Angeles (January 1999):  
UCLA Extension, Engineering and Computer Science Short Course, Winter 1999: *Data Mining Techniques and Applications* (faculty representative: Carlo Zaniolo, taught together with Dr. Rakesh Agrawal from IBM Almaden Research Centre and Dr. Wei-Min Shen from Univ. of Southern California).
- Jet Propulsion Lab (JPL), Pasadena, California (January 1999):  
Sponsored by UCLA Extension: *Data Mining and Applications* (taught together with Dr. Wei-Min Shen from Univ. of Southern California).
- Fudan Univ., Shanghai, China (July 1998):  
IBM Database Systems Summer Course sponsored by IBM Greater China, Summer 1998: *Data Mining and Data Warehousing Techniques* (taught together with Dr. Hongjun Lu from Hong Kong Univ. of Science and Technology).
- Univ. of California at Los Angeles (February 1998):  
UCLA Extension, Engineering and Computer Science Short Course, Winter 1998: *Data Mining Techniques and Applications* (faculty representative: Carlo Zaniolo, taught together with Dr. Rakesh Agrawal from IBM Almaden Research Centre and Dr. Wei-Min Shen from Univ. of Southern California).

## 4.3 Supervision of Graduate Students

- **Graduate degrees conferred as the sole thesis senior supervisor in Simon Fraser Univ.**
  1. Runying Mao, Adaptive-FP: An Efficient and Effective Method for Multi-level and Multi-dimensional Frequent Pattern Mining, (M.Sc., Simon Fraser, Spring 2001), technical staff, Microsoft, Redmond, Washington, U.S.A.
  2. Zhaoxia Wang, Collaborative Filtering Using Error Tolerant Fascicles, (M.Sc., Simon Fraser, Spring 2001), Computer Science Lecturer, B.C., Canada.
  3. Helen Pinto, Multi-dimensional Sequential Pattern Mining, (M.Sc., Simon Fraser, Spring 2001), software engineer, Calgary, Alberta, Canada.
  4. George Wenmin Li, Classification Based on Multiple Association Rules, (M.Sc., Simon Fraser, Spring 2001), software engineer, B.C., Canada.

5. Behzad Mortazavi-Asl, **Discovering and Mining User Web-Page Traversal Patterns**, (M.Sc., Simon Fraser, Spring 2001), software engineer, B.C., Canada.
6. Benjamin Xuebin Lu, **Fast Computation of Sparse Data Cubes and its Applications**, (M.Sc., Simon Fraser, Fall 2000), software engineer, Computer Associates Canada, Richmond, B.C., Canada.
7. Sonny H. S. Chee, **RecTree: A Linear Collaborative Filtering Algorithm**, (M.Sc., Simon Fraser, Fall 2000), software engineer, Pivotal Technology Inc., Vancouver, B.C., Canada.
8. Jean Fen-ju Hou, **Clustering with Obstacle Entities**, (M.Sc., Simon Fraser, Fall 1999), software engineer, CyberSource Inc., Palo Alto, California.
9. Jin Li, **Constructing Classification Tree with Exception Annotations for Large Data Warehouses**, (M.Sc., Simon Fraser, Fall 1999), software engineer, Seagate Software, B.C, Canada.
10. Qing Chen, **Mining Exceptions and Quantitative Association Rules in OLAP Data Cube**, (M.Sc., Simon Fraser, Summer 1999).
11. Wei Wang, **Predictive Modeling Based on Classification and Pattern Matching Methods**, (M.Sc., Simon Fraser, Summer 1999), software engineer, Seagate Software, B.C, Canada.
12. Krzysztof Koperski, **Progressive Refinement Approach to Spatial Data Mining**, (Ph.D., Simon Fraser, Spring 1999), research scientist, Mathsoft Inc., Seattle.
13. Osmar R. Zaïane, **Resource and Knowledge Discovery from the Internet and Multimedia Repositories**, (Ph.D., Simon Fraser, Spring 1999), assistant professor, University of Alberta, Edmonton, Alberta, Canada. (recipient of 1999 CATA award: Best post-graduate student award by Canadian Advanced Technology Alliance, one award is given each year in Computer Science and Software Engineering in Canada.)
14. Hua Zhu, **On-Line Analytical Mining of Association Rules**, (M.Sc., Simon Fraser, Fall 1998), software engineer, Nexmedia Inc., Vancouver, B.C, Canada.
15. Yin Jenny (Chiang) Tam, **Datacube: Its Implementation and Application in OLAP Mining**, (M.Sc., Simon Fraser, Fall 1998), software engineer, Simba Technology Inc., B.C, Canada.
16. Gabor Melli, **A Lazy Model-Based Approach to On-Line Classification**, (M.Sc., Simon Fraser, Spring 1998), technical staff, DataSage Inc., Boston, U.S.A.
17. Shan Cheng, **Statistical Approaches to Predictive Modeling in Large Databases**, (M.Sc., Simon Fraser, Spring 1998), technical staff, Statistical Canada, Ottawa, Canada.
18. Yijun (Alan) Lu, **Concept Hierarchy in Data Mining: Specification, Generation and Application**, (M.Sc., Simon Fraser, Fall 1997), technical staff, RDI-Data Warehouse Specialists, Vancouver, Canada.
19. Betty Bin Xia, **Similarity Search in Time Series Data Sets**, (M.Sc., Simon Fraser, Fall 1997). technical staff, IBM Canada Toronto Lab, Toronto, Canada.
20. Wan Gong, **Periodic Pattern Search in Time-Related Data Sets**, (M.Sc., Simon Fraser, Fall 1997), technical staff, Seagate Software, Vancouver, Canada.
21. Nebojsa Stefanovic, **Design and Implementation of On-Line Analytical Processing (OLAP) of Spatial Data**, (M.Sc., Simon Fraser, Fall 1997), technical staff, Seagate Software, Vancouver, Canada.
22. Yongjian Fu, **Discovery of Multiple-Level Rules from Large Databases**, (Ph.D., Simon Fraser, Fall 1996), assistant professor, Univ. of Missouri at Rolla, Missouri, U.S.A. (recipient of 1995 CATA award: Best post-graduate student award by Canadian Advanced Technology

Alliance, one award is given each year in Computer Science and Software Engineering in Canada.)

23. Ranabir Gupta, **Modeling changes in Information Systems**, (**Ph.D.**, Simon Fraser, Fall 1995), research scientist, Bell Northern Research, Ottawa, Canada.
  24. David Jim Gemmell, **Support for Continuous Media In Network File Servers**, (**Ph.D.**, Simon Fraser, Spring 1995), research scientist, Microsoft Research (Bay Area Research Center), San Fransisco, California, USA.
  25. Ling Liu, **Efficient Query Processing in Deductive Databases: The LogicBase Approach**, (**Ph.D.**, Simon Fraser, Spring 1995), research scientist, Systems House Solutions, Ottawa, Canada.
  26. Zhaohui Xie, **Query Evaluation in Deductive and Object-Oriented Databases (DOOD)**, (**Ph.D.**, Simon Fraser, Spring 1995), research scientist, Cognos Inc., Ottawa, Canada.
  27. Eric Kolotyuk, **Using X.500 to Facilitate the Creation of Information Systems Federations**, (**M.Sc.**, Simon Fraser, Fall 1994), technical staff, Vancouver, Canada.
  28. Tong Lu, **Compilation and Evaluation of Nested Linear Recursions: A Deductive Database Approach**, (**M.Sc.**, Simon Fraser, Fall 1993), technical staff, Microsoft, Redmond, Washington, U.S.A.
  29. Yue Huang, **Intelligent Query Answering by Knowledge Discovery Techniques**, (**M.Sc.**, Simon Fraser, Summer 1993), technical staff, B.C. Biomedical Labs, Burnaby, B.C., Canada.
  30. Wei Lu, **Spatial Database Design: A Deductive and Object-Oriented Approach**, (**Ph.D.**, Simon Fraser, Summer 1993), technical staff, Seagate Software, Vancouver, Canada.
  31. John Q. Wang, **Efficient Evaluation of Functional Recursive Query Programs**, (**M.Sc.**, Simon Fraser, Spring 1991), technical staff, Bell Northern Research, Ottawa, Canada.
  32. Xiaomei Xu, **Extending Relational DBMS for Spatiotemporal Information**, (**M.Sc.**, Simon Fraser, Summer 1990), technical staff, Ontario Hydro, Toronto, Canada.
- **Four graduate (M.S.) degrees conferred as the sole senior supervisor in Northwestern Univ. in 1987.**
    1. Chinying Chaou (**M.Sc.**, Northwestern, Spring 1987).
    2. Simon Lee (**M.Sc.**, Northwestern, Spring 1987).
    3. Sangoo Lee (**M.Sc.**, Northwestern, Spring 1987), (later Ph.D. Northwestern, 1990, faculty member, Department of Computer Science and Statistics, Seoul National University, Seoul, Korea).
    4. Danling Shi (**M.Sc.**, Northwestern, Winter 1987).
  - **Current graduate students under my supervision (as the sole thesis senior supervisor).**
    - **Ph.D. students:**
      1. Mr. Shi Cong. Research area: *geo-spatial data mining*.
      2. Mr. Wen Jin. Research area: *clustering, Web mining*.
      3. Mr. Eddie Kim. Research area: *Time-series analysis, mining case-base*.
      4. Mr. Jian Pei. Research area: *Frequent pattern mining, Web mining*.
      5. Mr. Anthony K. H. Tung. Research area: *Spatial data mining, text data mining*.

6. Mr. Zhong Zhang. Research area: *Web mining, intelligent query answering.*

– **M.Sc. students:**

1. Mr. Eugene Belchev. Research area: *Web mining, telecommunication data mining.*

2. Mr. Haiming Huang. Research area: *Web mining, data compression by data mining.*

3. Ms. Julia Itskevitch. Research area: *E-mail mining.*

4. Ms. Joyce Man Lam. Research area: *Data mining applications, comparative analysis.*

5. Ms. Nancy Liao. Research area: *DNA sequence mining.*

6. Mr. Yiwen Yin. Research area: *Financial data mining, association/causality rules.*

7. Ms. Yvonne Zheng. Research area: *Scalable statistical data mining, statistical OLAP.*

• **Serving as the second supervisor on graduate supervisory committees.**

– Simon Fraser University: for 30 graduate students.

– Northwestern University: for 7 graduate students.

#### 4.4 Training Other Research Professionals

• **Supervising postdoctoral research fellows and visiting scholars.**

I have supervised the research of 14 visiting scholars from the following countries: Australia (1), Canada (2), China (6), France (1), Germany (1), Japan (2), Hong Kong (1), New Zealand (1), Singapore (1).

• **Serving as thesis external examiner.**

Besides serving as thesis external examiner for many Ph.D. and M.Sc. thesis defense exams in Computing Science, SFU, I have served as thesis external examiner for Ph.D. and/or M.Sc. theses of the following universities: Univ. of Alberta (1992, 1997), Univ. of Calgary (1993), Univ. of Cape Town (South Africa) (1993), National Univ. of Singapore (1993), Univ. of Hong Kong (Hong Kong) (1995), McGill Univ. (1995), Concordia Univ. (1996), Chinese Univ. of Hong Kong (Hong Kong) (1996, 1997), Univ. of Munich (Germany) (1998, 2000), Univ. of Melbourne (Australia) (2000), and Univ. of South Australia (Australia) (1999).

#### 4.5 Administration and Other Services in the University

1. **Director**, *Intelligent Database Systems Research Laboratory*, Computing Science, Simon Fraser Univ., Sept. 1997—present.
2. **Member**, *Departmental Tenure Committee*, Computing Science, Simon Fraser Univ., 2000—2001.
3. **Member**, *Faculty Recruiting Committee*, Computing Science, Simon Fraser Univ., 1998—1999, 2000—2001.
4. **Member**, *Adjudication Committee of Ebco/Eppich Scholarship on Expert Systems*, Centre for Systems Science, Simon Fraser Univ., 1998—2001.
5. **Member**, *Program Structure Committee*, Computing Science, Simon Fraser Univ., 1997—1998.
6. **Director**, *Database Systems Research Laboratory*, Computing Science, Simon Fraser Univ., 1994—1997.
7. **Member**, *Graduate Admission Committee*, Computing Science, Simon Fraser Univ., 1996—1997.

8. **Chairman**, *Graduate Admission Committee*, Computing Science, Simon Fraser Univ., 1994—1995.
9. **Group leader**, *Data and Knowledge Engineering Research Group, Centre for Systems Science, Simon Fraser Univ.*, 1987—1993.
10. **Member**, *Graduate Program Committee*, Computing Science, Simon Fraser Univ., 1988—1992, 1994—1995.
11. **Director**, *Graduate Program Committee*, Computing Science, Simon Fraser Univ., 1990—1991.
12. **Chairman**, *Ph.D. Comprehensive Examination Committee*, Computing Science, Simon Fraser Univ., 1990—1991.
13. **Member**, *Graduate Program Committee*, Department of Electrical Engineering and Computer Science, Northwestern Univ., 1986—1987.

## 5 Professional Activities

### 5.1 Editing of Scientific Journals

1. **Subject Editor**, **IEEE Transactions on Knowledge and Data Engineering (TKDE)**, (1996—2000).
2. **Associate Editor**, **Journal of Intelligent Information Systems (JIIS)**, Kluwer Publishers, (1997—present).
3. **Associate Editor**, **Data Mining and Knowledge Discovery (DAMI)**, Kluwer Publishers, (1997—present).
4. **Special issue guest co-editor**, **IEEE Transactions on Knowledge and Data Engineering (TKDE)**, special issue on Data Mining and Knowledge Discovery (1996).
5. **Special issue guest co-editor**, **Journal of Intelligent Information Systems (JIIS)**, special issue on Data Mining (1997).
6. **Special issue guest co-editor**, **Data Mining and Knowledge Discovery (DAMI)**, special issue on Mining Knowledge in Large Database (1998).

### 5.2 Organization of International Societies, Conferences, and Workshops

1. **Advisory committee member**, ACM SIGKDD (1998—present)
2. **Program committee co-chairman**, 2002 SIAM Data Mining Conf. (SIAMDM'02)
3. **Program committee vice-chairman**, 2002 Int. Conf. on Data Engineering (ICDE'02)
4. **Program committee co-chairman**, 2002 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD'02)
- 5.
6. **Conference best paper awards chairman**, 2001 Int. Conf. on Knowledge Discovery and Data Mining (KDD'01)
7. **Program committee co-chairman**, 2001 SIAM Data Mining Conf. (SIAMDM'01)
8. **Conference co-chairman**, 2001 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD'01)

9. **Conference exhibition program chairman**, 2000 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD'00)
10. **Award committee chairman**, ACM SIGKDD (1998—1999)
11. **Conference tutorial chairman**, 1999 Int. Conf. on Knowledge Discovery and Data Mining (KDD'99)
12. **Steering committee member**, 1996-1998 Int. Conf.'s on Knowledge Discovery and Data Mining (KDD'96—98)
13. **Project initiative co-leader**, Project: Discovering Geographic Knowledge in Data-Rich Environments, (1999–), U.S. National Center for Geographic Information and Analysis (NCGIA)
14. **Workshop co-organizer**, 1996 and 1997 ACM SIGMOD Int. Workshops on Data Mining and Knowledge Discovery (DMKD'96-97)
15. **Conference program committee co-chairman**, 1996 (2nd) Int. Conf. on Knowledge Discovery and Data Mining (KDD'96)
16. **Workshop co-organizer**, 1995 (1st) Int. Workshop on Integration of Knowledge Discovery with Deductive and Object-Oriented Databases (KDOOD)
17. **Program committee vice-chairman**, 1995 Int. Conf. on Data Engineering (ICDE'95)
18. **Treasurer**, 1993 Int. Logic Programming Symp. (ILPS'93)
19. **PC member and local organizer**, 1993 ILPS'93 Workshop on “Programming with Logic Databases”
20. **Steering committee member and PC member**, 1993 Int. Conf. on Building and Sharing of Very Large Scale Knowledge Bases (KB&KS'93)

### **5.3 Serving in the Program Committees of International Conferences and Workshops as PC Member**

1. 2002, 2001, 1999, 1998, 1995, 1992 and 1991 Int. Conf.'s on Data Engineering (ICDE'02, ICDE'01, ICDE'99, ICDE'98, ICDE'95, ICDE'92, and ICDE'91)
2. 2002, 1999, and 1996 ACM SIGMOD Int. Conf.'s on Management of Data (SIGMOD'02, SIGMOD'99, and SIGMOD'96)
3. 2001, 1999, 1998, 1997, and 1996 Int. Conf.'s on Data Mining and Knowledge Discovery (KDD'01, KDD'99, KDD'98, KDD'97, and KDD'96)
4. 2001 Int. Conf. on Principles and Practice of Knowledge Discovery in Databases (PKDD'01)
5. 2001, 2000 Int. Conf. on Scientific and Statistical Database Management (SSDBM'2001, SSDBM'2000)
6. 2001, 1999 and 1995 Int. Conf.'s on Database Systems for Advanced Applications (DASFAA'01, DASFAA'99, and DASFAA'95)
7. 2001, 2000, 1999 Int. Conf. on Data Warehousing and Knowledge Discovery (DaWak'01, DaWak'00, and DaWak'99)
8. 2001, 2000, 1999, 1998 Int. Database Engineering and Applications Symposium (IDEAS'01, IDEAS'00, IDEAS'99, and IDEAS'98)

9. 2001 Int. Workshops on Research Issues in Data Engineering. (Theme: Document Management for data intensive business and scientific applications) (RIDE'01).
10. 2001 Int. Symp. on Cooperative Database Systems for Advanced Applications (CODAS'01)
11. 2001, 2000 Int. Conf.'s on Web-Age Information Management (WAIM'2001, WAIM'2000)
12. 2000, 1999, 1997, 1996, 1995 Int. Conf.'s on Information and Knowledge Management (CIKM'00, CIKM'99, CIKM'97, CIKM'96, and CIKM'95)
13. 2000, 1995 Int. Conf.'s on Management of Data (COMAD'00, and COMAD'95)
14. 2000, 1996 Int. Conf. on Very Large Databases (VLDB'00, and VLDB'96)
15. 2000 Int. Conf. on Extending Data Base Technology (EDBT'00)
16. 2000 Int. Workshop on Advanced Issues of E-Commerce and Web-based Information Systems (WECWIS 2000)
17. 2000, 1999, 1998, 1997, 1996 ACM SIGMOD Int. Workshop on Data Mining and Knowledge Discovery (DMKD'00, DMKD'99, DMKD'98, DMKD'97, and DMKD'96)
18. 2000, 1999, 1998, and 1997 Pacific-Asia Conf.'s on Knowledge Discovery and Data Mining (PAKDD'00, PAKDD'99, PAKDD'98, and PAKDD'97)
19. 2000 In. Conf. on Visual Information Systems (VISUAL 2000)
20. 1999, 1997, and 1993 Int. Symposiums on Large Spatial Databases (SSD'99, SSD'97, and SSD'93)
21. 1998 Int. Workshop on Data warehousing and OLAP (DOLAP) in conjunction with CIKM98 conference (DOLAP'98)
22. 1998 Int. Workshop on Data Mining for Information Mediation, in conjunction with the 9th Int. Conf. on Database and Expert Systems Applications (DEXA'98)
23. 1997 Int. Conf. on Computer-Assisted Information Retrieval (RIAO'97)
24. 1997 and 1992 Int. Workshops on Research Issues in Data Engineering. (Theme: High Performance Database Management for Large Scale Applications) (RIDE'97), and (Theme: Transaction and Query Processing) (RIDE'92)
25. 1995 Int. Conf. on Deductive and Object-Oriented Databases (DOOD'95)
26. 1995 (3rd) ACM Int. Workshop on Advances in Geographic Information Systems (ACMGIS'95)
27. 1995 Int. Conf. on Algebraic Methodology and Software Technology (AMAST'95)
28. 1994 Int. Workshop on Rough Sets and Soft Computing (RSSC'94)
29. 1994 ICLP (Int. Conf. on Logic Programming) Workshop on Deductive Databases,
30. 1994 ILPS (Int. Logic Programming Symp.) Workshop on Uncertainty in Databases and Deductive Systems,
31. 1993 Far East Workshop on Geographic Information Systems (FEGIS'93)
32. 1993 IEEE Int. Conf. on Tools with Artificial Intelligence (TAI'93)
33. 1993 Int. Workshop on Rough Sets and Knowledge Discovery (RSKD'93)
34. 1992 Int. Workshop on Machine Discovery (MD'92)
35. 1990 Int. Conf. on Software Engineering and Knowledge Engineering (SEKE'90).

## 5.4 Refereeing and Reviewing of Journal and Conference Submissions

### 1. Refereeing of journal submissions:

ACM Trans. on Database Systems (TODS), Communications of ACM (CACM), Data Mining and Knowledge Discovery: An International Journal (DAMI), IEEE Trans. on Knowledge and Data Eng. (TKDE), The VLDB Journal, IEEE Trans. on Software Eng. (TSE), IEEE Computer, Journal of Logic Programming (JLP), Journal of Intelligent Information Systems (JIIS), Intelligent Data Analysis, Knowledge and Information Systems: An International Journal, Information Sciences, Information Systems, The Computer Journal, Int. J. of Software Eng. and Knowledge Eng., Computational Intelligence, Int. J. of Expert Systems, Int. J. of Geographical Information Systems, Trans. of Information and Systems (IEICE), Distribute and Parallel Databases: An Int. Journal, New Generation Computing, Information Processing Letters, Applied Math. Letters, Journal of Computer and Software Engineering, etc.

### 2. Refereeing of conference submissions:

ACM-SIGMOD Int. Conf.'s on Management of Data (SIGMOD), Int. Conf.'s on Very Large Data Bases (VLDB), Int. Conf.'s on Data Eng. (ICDE), Int. Conf.'s on Data Mining and Knowledge Discovery (KDD), Int. Conf.'s on Extending Database Technology (EDBT), Int. Symp.'s on Large Spatial Databases (SSD), Int. Joint Conf.'s on Artificial Intelligence (IJCAI), National Conf. on Artificial Intelligence (AAAI), Int. Symp. on Database Systems for Advanced Applications (DASFAA), Int. Conf.'s on Algebraic Methodology and Software Technology (AMAST), IEEE Int. Conf.'s on Tools with Artificial Intelligence (TAI), Int. Conf.'s on Information and Knowledge Management (CIKM), Int. Conf.'s on Cooperative Information Systems (CoopIS), Int. Conf. on Visual Information Systems (Visual), Int. Conf.'s on Data and Knowledge-Bases (DKB). Int. Conf.'s on Deductive and Object-Oriented Databases (DOOD), Int. Conf. on 5th Generation Computer Systems (FGCS), Int. Conf.'s on Computing and Information (ICCI), Int. Conf. on Computer-Assisted Information Retrieval (RIAO), Int. Conf.'s on Management of Data (COMAD), Int. Conf.'s on Software Eng. and Knowledge Eng. (SEKE), ACM Symp. on Applied Computing (SAC), Canadian AI Conf. (AI), European Conf. on Machine Learning (ECML), Pacific-Asia Int. Conf.'s on Knowledge Discovery and Data (PAKDD), Pacific Rim Int. Conf.'s on Artificial Intelligence (PRICAI), CIPS Conf. on Information Technology (CIPS), Cascon Conf.'s: Meeting of Minds (CASCON), Int. Workshop on Machine Discovery (MD), Int. Workshops on Research Issues in Data Engineering (RIDE), Int. Workshops on Rough Sets and Soft Computing (RSSC), ILPS Workshop on "Programming with Logic Databases" (PLD), etc.

## 5.5 Reviewing of Research Grant Applications, Book Proposals, Faculty Promotion Applications

### 1. Refereeing research grant applications for research funding agencies:

- NSERC (Natural Sciences and Engineering Research Council of Canada) (1990—present) (including operating research grant, strategic grant, collaborative research and development (CRD) grant applications, etc.)
- NASA Research Program on Intelligent Systems (U.S.A.) (2000).
- Singapore: National Science and Technology Board (2000).
- Hong Kong Research Council (1995, 1997, 1999).
- Austrian Science Research Council (1998).
- Australia Research Council (Large Grant Assessment) (1997).

- NSF (U.S. National Science Foundation) (1988—1992, served on the U.S. NSF review board in 1996).
- Advanced System Institute of British Columbia (1996).
- Science Council of British Columbia (1994).

## 2. Refereeing for books or special projects:

- Evaluation of two book proposals for Morgan Kaufmann Publishers (2000, 2001).
- Evaluation of one article for “Wiley Encyclopedia of Software Engineering”, John Wiley and Sons, (2000).
- Evaluation of one book proposal for Prentice Hall (1999).
- Evaluation of two special issue proposals for IEEE Transactions on Knowledge and Data Engineering (TKDE) (1997, 1998).
- Evaluation of one article for “Encyclopedia of Electrical and Electronics Engineering” to be published by John Wiley and Sons, (1997).
- Evaluation of one book proposal for The MIT Press (1996).
- Evaluation of one book (including the book proposal) for IEEE Computer Society Press (1995).
- Evaluation of the proposal of a new journal, “Knowledge-based Engineering” (1994).
- Evaluation of the project, “Fifth Generation Computer Systems (FGCS of ICOT, Japan)” (1992).

## 3. Refereeing for tenure and/or promotion applications:

- **Tenure and/or promotion for Assistant Professor to Associate Professor** for the candidates in the departments of computer/computing science in the following universities:  
George Mason Univ. (2000, 1998). National U. of Singapore (**Senior Lecturer**) (2000, 1998, 1993). Oregon Graduate Institute of Science and Technology (1999). U. of Southern California (1998). U. of British Columbia (award recommendation) (1999, 1998). U. of Munich (1998). U. of Regina (1998). Chinese U. of Hong Kong (1998). U. of Southwest Louisiana (1996). U. of Central Florida (1994). U. of Western Ontario (1994). Southern Illinois U. at Carbondale (1994). Concordia U. (1993). U. of North Carolina at Charlotte (1992). U. of Alberta (1991).
- **Promotion for Associate Professor to Full Professor** for the candidates in the departments of computer/computing science in the following universities:  
Colorado Schools of Mine (2000). U. of Regina (1993, 1994, 1999, 2000). U. of Alberta (1996 and 1997). Monash U. (Australia) (1997). U. of North Carolina at Greensboro (1996).
- **Promotion for Staff Scientist to Senior Scientist:**  
Lawrence Berkeley Laboratory, Berkeley, California, U.S.A. (1995).

## 5.6 Member in Professional Societies

1. Association for Computing Machinery (ACM)
2. IEEE Computer Society (IEEE/CS)
3. ACM Special Interest Group on Management of Data (SIGMOD)
4. ACM Special Interest Group on Knowledge Discovery and Data Mining (SIGKDD)

5. IEEE/CS Technical Committee on Data Engineering
6. American Association for Artificial Intelligence (AAAI)
7. IFIP WG 2.6 (Database Systems)
8. IRIS/PRECARN (Institute for Robotics and Intelligent Systems and the Networks of Centres of Excellence Program of the Government of Canada with the participation of PRECARN Associates Inc.)

## 6 Tutorials or Invited Talks

### 6.1 Tutorials in International or National Conferences or Symposiums

1. **Conference tutorial:** “*Frequent Pattern Mining Methods and Applications: An Overview*,” (with Laks V.S. Lakshmanan and Jian Pei) 2001 International Conf. on Knowledge Discovery and Data Mining (KDD-02), San Jose, California, August 2001 (scheduled).
2. **Conference tutorial:** “*Sequential Pattern Mining: From Shopping History Analysis to Weblog Mining and DNA Mining*,” (with Jian Pei) 2001 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD-01), Hong Kong, April 2001.
3. **Conference tutorial:** “*From Data Mining To Web Mining: An Overview*”, 2000 Int. Database Systems Conf. (IDS'2000), Hong Kong, June 2000.
4. **Conference tutorial:** “*Technologies for Mining Frequent Patterns in Large Databases*”, 2000 Int. Database Systems Conf. (IDS'2000), Hong Kong, June 2000.
5. **Conference tutorial:** “*Data Mining: An Overview from Database Perspective*”, 1998 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD-98), Melbourne, Australia, April 1998.
6. **Symposium tutorial:** “*Spatial Data Mining and Spatial Data Warehousing*”, 1997 Int. Symp. Large Spatial Databases (SSD'97), Berlin, Germany, July 1997.
7. **Conference tutorial:** “*Integration of of Data Mining and Data Warehousing Technologies*”, 1997 Int. Conf. Data Engineering (ICDE'97), Birmingham, England, April 1997.
8. **Conference tutorial:** “*Data Mining Techniques*”, 1996 ACM/SIGMOD Int. Conf. on Management of Data (SIGMOD'96), Montreal, Canada, June 1996.
9. **Conference tutorial:** “*Data Mining Techniques: An Overview from a Database Perspective*”, 1996 Int. Conf. on Cooperative Information Systems (CoopIS'96), Brussels, Belgium, June 1996.
10. **Conference tutorial:** “*From Database Systems to Knowledge-Base Systems: An Evolutionary Approach*”, The 11th Int. Conf. on Data Engineering (ICDE'95), Taipei, Taiwan, March 1995.
11. **Conference tutorial:** “*Towards Intelligent Database Systems: A Tutorial on Deductive and Object-Oriented Databases and Data Mining Technologies*”, 1994 IRIS Conference (IRIS'94), Toronto, Canada, June 1994.
12. **Symposium tutorial:** “*Towards Intelligent Spatial Database Systems*”, The 3rd Int. Symp. on Large Spatial Databases (SSD'93), Singapore, June 1993.
13. **Conference tutorial:** “*DBLearn: Knowledge Discovery in Databases*”, 1993 IRIS Conference (IRIS'93), Ottawa, Canada, June 1993.

## 6.2 Invited Speeches in International Conferences, Symposiums, or Workshops

1. **Conference invited talk:** “*Association-Based Classification in Data Mining*”, 2001 Conf. of Society on Classification, Munich, Germany, March 2001.
2. **Conference keynote speech:** “*Towards Integrated, Intelligent Tools for Data Mining*”, 2000 IEEE Int. Conf. on Tools with Artificial Intelligence (ICTAI'00), Vancouver, Canada, November 2000.
3. **Panel speech:** “*Association-Based Spatial Classification*”, Panel on Spatial Data Mining, 2000 Int. Workshop on Mining Scientific Databases (MSD'2000), (organized by Vipin Kumar and Shashi Shekhar), Minneapolis, Minnesota, July 2000.
4. **Panel speech:** “*Research Issues on Web Mining*”, Panel on Web Mining, 2000 Int. Database Systems Conf. (IDS'2000), Hong Kong, June 2000.
5. **Panel talk:** “*Towards Integrated Mining, “Vertical” Data Mining, and Invisible Data Mining*”, Panel of 2000 ACM-SIGMOD Workshop on Data Mining and Knowledge Discovery (DMKD'00), (organized by Umeshwar Dayal), Dallas, Texas, May 2000.
6. **Workshop speaker:** “*Mining Frequent Patterns without Candidate Generation*”, IBM/DIMACS Workshop on Data Mining In the Internet Age, (invited by Rakesh Agrawal, Joan Feigenbaum, Prabhakar Raghavan, and Jeff Ullman), IBM Almaden, San Jose, California, May 2000.
7. **Panelist** for the panel, “*Data Mining: The New Frontier of High Performance Computing?*”, SuperComputing'99), (with Steve Ashby, Alok Choudhary, Robert Hollebeek, and Raju Naburu, organized by Vipin Kumar), Portland, Oregon, U.S.A., November 1999.
8. **Panelist** for the panel, “*Web Mining: Challenges and Opportunities*”, 1999 ACM SIGMOD Int. Conf. on Management of Data (SIGMOD-99), (with Rakesh Agrawal, Surajit Chaudhuri, Umeshwar Dayal, Raghu Ramakrishnan, and Jeff Ullman, organized by Minos Garofalakis et al.), Philadelphia, PA, U.S.A., June 1999.
9. **Workshop invited talk:** “*An Overview of Methods for Geo-Spatial Data Mining*”, NCGIA Varenus Workshop (Specialistic Meeting) on Discovering Geographic Knowledge in Data-Rich Environments, Kirkland, Washington, March 1999.
10. **Invited speech:** “*Towards On-Line Analytical Processing and Data Mining for Electronic Commerce*”, 1998 Int. Workshop on Technological Challenges of Electronic Commerce (TCEC-98), Toronto, Canada, Sept. 1998.
11. **Panelist** for the panel, “*Database-Data Mining Coupling*”, 1998 Int. Conf. on Knowledge Discovery and Data Mining (KDD-98), (with Rakesh Agrawal, Surajit Chaudhuri, Tomasz Imielinski, Heikki Mannila, and Jan Zytkow), New York, U.S.A., August 1998.
12. **Invited speech:** “*Towards On-Line Analytical Mining*”, 1998 Int. Database Engineering and Applications Symp. (IDEAS-98), Cardiff, England, July 1998.
13. **Panelist** for the panel: “*Data Mining: How to Proceed?*”, 1998 ACM-SIGMOD Workshop on Data Mining and Knowledge Discovery (DMKD-98), (organized by Umesh Dayal and Surajit Chaudhuri), Seattle, U.S.A., June 1998.
14. **Invited speech:** “*Weblog Mining and Data mining in Digital Libraries*”, 1998 IEEE Advances in Digital Libraries Conf. (ADL'98), Santa Barbara, CA, April 1998.

15. **Panelist** for the panel: “*Database Technology and Digital Libraries*”, 1998 IEEE Advances in Digital Libraries Conf. (ADL'98), (with Christos Faloutsos and Nabil Adam), Santa Barbara, CA, April 1998.
16. **Panelist** for the panel, “*Can Data Mining Be Proceduralized?*”, 1998 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD-98), (organized by Ross Quinlan), Melbourne, Australia, April 1998.
17. **Invited keynote speech**: “*Towards On-Line Analytical Mining: An Integration of Data Mining and Data Warehousing Technologies*”, 1998 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD-98), Melbourne, Australia, April 1998.
18. **Invited speech**: “*Parallel and Distributed On-Line Analytical Mining*”, Pre-PAKDD'98 Workshop on Parallel and Distributed Data Mining, Melbourne, Australia, April 1998.
19. **Panelist** for the panel, “*Data Mining: The Next Step*”, 1997 CASCON Conf.: Meeting of Minds, (organized by Ken Sevcik and Nick Cercone), Toronto, Canada, November 1997.
20. **Invited keynote speech**: “*OLAP Mining: An Integration of Data Mining and Data Warehousing*”, 7th IFIP WG 2.6 Working Conference on Database Semantics (DS-7), Leysin, Switzerland, October 1997.
21. **Invited workshop presentation**: “*An Overview of OLAP-Based Data Mining Techniques*”, 1997 NASA-CESDIS Workshop on Data Mining, Data Warehousing, and High Performance Computing, Greenbelt, Maryland, August 1997.
22. **Invited workshop presentation**: “*OLAP Mining: An Integration of Data Mining and Data Warehousing*”, 1997 Summer Institute of Data Mining, Microsoft Research and University of Washington, Seattle, WA, July 1997.
23. **Panel coordinator** for the panel: “*Data Mining: Where Is It Heading?*”, 1997 Int. Conf. Data Engineering (ICDE'97), Birmingham, England, (with panelists Rakesh Agrawal, Randy Goebel, Daniel Keim, and Avi Silberschatz), April 1997.
24. **Invited workshop presentation**: “*ForestInfo: A Powerful Forest Information System for Mining Information from Forest Databases*”, 1996 Workshop on Forest Information Systems (WFIS'96), Vancouver, BC, December 1996.
25. **Invited workshop presentation**: “*Integration of Data Mining and Data Warehousing: The DBMiner Experience*”, 1996 IFIP W2.6 Workshop on Database Systems (IFIP'96), Rockville, Maryland, November 1996.
26. **Panel coordinator and panelist** for the panel: “*Systems for mining knowledge in large databases*”, The 2nd Int. Conf. on Data Mining and Knowledge Discovery (KDD'96), (with Rakesh Agrawal, et al.), Portland, Oregon, March 1996.
27. **Invited workshop presentation**: “*Data Mining Techniques*”, 1996 IFIP W2.6 Workshop on Database Systems (IFIP'96), Antwerp, Belgium, June 1996.
28. **Invited speech**: “*Data Mining: A Database Perspective*”, 1996 Symposium “Data Mining and Beyond”, Portland, Oregon, May 1996.
29. **Invited talk**: “*Mining Knowledge at Multiple Concept Levels*”, 1995 Int. Conf. on Information and Knowledge Management (CIKM'95), Baltimore, Maryland, Nov. 1995.

30. **Panelist** for the panel: “*Resource Discovery: The Torch in the Deep Darkness of Information Super-highway?*”, (with Hector Garcia-Molina, Amit Sheth, and Y. Masunaga), The 11th Int. Conf. on Data Engineering (ICDE’95), Taipei, Taiwan, March 1995.
31. **Panelist** for the panel: “*Applications of Deductive Database Technology*”, 1993 ILPS (Int. Logic Programming Symp.) Workshop on “Programming with Logic Databases”, (with Raghu Ramakrishnan, Dik Tsur, D. S. Warren, and Carlo Zaniolo), Vancouver, Canada, Nov. 1993.
32. **Invited symposium overseas speaker**: “*Knowledge Discovery in Large Databases*”, Computer World’92 (2nd Int. Symp.), Kobe, Japan, Nov. 1992.
33. **Invited speech**: “*What Kind of Knowledge Can Be Discovered in Databases?*”, National Symp. on Conceptual Formation and Knowledge Acquisition, Tokyo, Japan, October 1992.
34. **Invited keynote speech**: “*Efficient Deduction and Induction—Key to the Success of Data-Intensive Knowledge-Base Systems*”, Workshop on Formal Methods in Databases and Software Engineering, Montreal, Canada, May 1992.

### 6.3 Seminar or Invited Talks in Universities

Univ. of Pisa, Italy (2001). Univ. of Munich, Germany (2001). Univ. of Illinois at Urbana-Champaign (2001). Univ. of Washington (2001). Univ. of California at Davis (2001). Univ. of North Carolina at Chapel Hill (2001, 2000). North Carolina State Univ. (2000). Univ. of British Columbia (2000, 1999, 1993). Univ. of Minnesota (1999). Univ. of California, Los Angeles (1999). Univ. of California, Riverside (1999). Univ. of Michigan (1999). Rutgers Univ. (1998). Univ. of Alberta (1998: distinguished lecture, 1991, 1995). Univ. of Washington & Microsoft Research (1997). McGill Univ. (1995). Univ. of Hong Kong (1995). Chinese Univ. of Hong Kong (1995). Hong Kong Univ. of Science and Technology (1995). Univ. of Ottawa (1993). Kyoto Univ. (1992). Univ. of Calgary (1992). Concordia Univ. (1992, 1995). Hiroshima Univ. (1991). Kyushu Institute of Technology (1991). Univ. of Toronto (1987). Univ. of Waterloo (1987). Simon Fraser Univ. (1987—present). Northwestern Univ. (1989, 1993, 1994, 1996).

### 6.4 Seminar or Invited Talks in Industry Firms or Government Agencies

Boeing (U.S.A.) (2001, 1999, 1998, 1997). HP Lab (U.S.A.) (2000, 1999). Microsoft (U.S.A.) (2000). IBM Almaden Research Centre (U.S.A.) (2000). JPL (U.S.A.) (1999). ISM (Information Systems Management)-BC (Canada) (1998, 1999). BC Hydro meeting on Information Technology (Canada) (1998, 1999). MacDonald Dettwiler & Associates (Canada) (1993, 1996, 1998). Shanghai Computer Association (China) (1998). CSIRO and ARCSys (Australia) (1998). Hong Kong Bank of Canada (Canada) (1998). NASA-Goddard Space Flight Center (U.S.A.) (1997). Cognos (Canada) (1997). Seagate Software (Canada) (1996, 1997). Bellcore (U.S.A.) (1996). Informix (U.S.A.) (1996). MPR Teltech (Canada) (1993, 1996). ICOT (Institute of New Generation Computing) (Japan) (1992).

## 7 Research Publications

### 7.1 Books, Edited Conference Proceedings, and Edited Journal Special Issues

1. R. Agrawal, H. Mannila, and J. Han (eds.), **Readings in Data Mining: A Database Perspective**, Morgan Kaufmann, (in preparation).

2. H. Miller and J. Han (eds.), **Geographic Data Mining and Knowledge Discovery**, Taylor and Francis, 2001.
3. R. L. Grossman, E.-H. Han, J. Han, and V. Kumar (eds.), **Proceedings of the 1st SIAM Int. Conf. on Data Mining (SDM-2001)**, SIAM, Philadelphia, 2001.
4. J. Han and M. Kamber, **Data Mining: Concepts and Techniques**, (Foreword by Jim Gray), Morgan Kaufmann, 2000 (550 + xxiv pages).
5. J. Han (ed.), **Tutorial Notes for ACM SIGKDD 1999 International Conference on Knowledge Discovery and Data Mining**, ACM Press, 1999.
6. R. T. Ng, J. Han, and L. V. S. Lakshmanan (eds.), **Special Issue on SIGMOD-97 Data Mining Workshop, Data Mining and Knowledge Discovery**, 2(3), 1998.
7. J. Han, L. V. S. Lakshmanan, and R. T. Ng (eds.), **Special Issue on Data Mining**, Journal of Intelligent Information Systems, 9, 1997.
8. M.-S. Chen, J. Han, and P.S. Yu (eds.), **Special Issue on Data Mining**, IEEE Transactions on Knowledge and Data Engineering, 8(6), 1996.
9. E. Simoudis, J. Han, and U. Fayyad (eds.), **Proceedings of the 2nd Int. Conf. on Data Mining and Knowledge Discovery (KDD'96)**, AAAI Press, 1996.

## 7.2 Articles in Refereed Journals

### 2001 (accepted for publication)

1. R. Ng and J. Han, "*CLARANS: A Method for Clustering Objects for Spatial Data Mining*", accepted by IEEE Transactions on Knowledge and Data Engineering (with minor revision), Dec. 2000.
2. A. K. H. Tung, H. Lu, J. Han, and L. Feng, "*Breaking the Barrier of Transactions: Mining Inter-Transaction Association Rules*", accepted by IEEE Transactions on Knowledge and Data Engineering (with minor revision), Mar. 2001.

### 2000

3. N. Stefanovic, J. Han, and K. Koperski, "*Object-Based Selective Materialization for Efficient Implementation of Spatial Data Cubes*," IEEE Transactions on Knowledge and Data Engineering, 12(6): 938-958, 2000.
4. H. Lu, L. Feng, and J. Han, "*Beyond Intra-Transaction Association Analysis: Mining Multi-Dimensional Inter-Transaction Association Rules*", ACM Transactions on Information Systems, 18(4): 423-454, 2000.
5. J. Han and J. Pei, "*Mining Frequent Patterns by Pattern-Growth: Methodology and Implications*", ACM SIGKDD Explorations (Special Issue on Scalable Data Mining Algorithms), 2(2):19-26, 2000.
6. D. Cheung, C. Hwang, A. Fu, and J. Han, "*Efficient Rule-Based Attributed-Oriented Induction for Data Mining*", Journal of Intelligent Information Systems, 15(2): 175-200, 2000.

### 1999

7. J. Han, L. V. S. Lakshmanan, and R. T. Ng, "*Constraint-Based, Multidimensional Data Mining*", COMPUTER (special issues on Data Mining), 32(8): 46-50, 1999.
8. K. Koperski, J. Han, and G. B. Marchisio, "*Mining Spatial and Image Data through Progressive Refinement Methods*", Revue internationale de gomatique (European Journal of GIS and Spatial Analysis), 9(4):425-440, 1999.

9. J. Han and Y. Fu, “*Discovery of Multiple-Level Association Rules from Large Databases*”, IEEE Transactions on Knowledge and Data Engineering, 11(5):798-805, 1999.
10. J. Han, Z. Xie, and Y. Fu, “*Join Index Hierarchy: An Indexing Structure for Efficient Navigation in Object-Oriented Databases*”, IEEE Transactions on Knowledge and Data Engineering, 11(2):321-337, 1999.

#### 1998

11. D. Li, J. Han, X. Shi, and M. C. Chan, “*Knowledge Representation and Discovery Based on Linguistic Atoms*”, (Special Issue on “KDD: Techniques and Applications”) Knowledge-Based Systems (Elsevier Science), 10(7):431-440, 1998.
12. J. Han, “*Towards On-Line Analytical Mining in Large Databases*”, ACM SIGMOD RECORD, 27(1):97-107, 1998.
13. J. Han, S. Nishio, H. Kawano, and W. Wang, “*Generalization-Based Data Mining in Object-Oriented Databases Using an Object-Cube Model*”, Data and Knowledge Engineering, 25(1-2):55-97, 1998.
14. J. Han, L. Liu and T. Lu, “*Evaluation of Declarative N-Queens Recursion: A Deductive Database Approach*”, Information Science, 105:69-100, 1998.

#### 1996

15. M.-S. Chen, J. Han, and P.S. Yu, “*Data Mining: An Overview from Database Perspective*”, IEEE Transactions on Knowledge and Data Engineering, 8(6):866-883, 1996.
16. H. Kawano, S. Nishio, J. Han, and T. Hasegawa, “*Integration of Knowledge Discovery and Active Database Technologies*”, Journal of Japanese Society for Artificial Intelligence, 11(5):752-760, 1996 (in Japanese).
17. J. Han, Y. Huang, N. Cercone, and Y. Fu, “*Intelligent Query Answering by Knowledge Discovery Techniques*”, IEEE Transactions on Knowledge and Data Engineering, 8(3):373-390, 1996.
18. J. Han, Y. Fu, K. Koperski, G. Melli, W. Wang, O. R. Zaïane, “*Knowledge Mining in Databases: An Integration of Machine Learning Methodologies with Database Technologies*, Canadian Artificial Intelligence, 38:4-8, 1996.
19. B. C. Ooi, J. Han, H. Lu, and C. C. Low, “*Index-Nesting—An Efficient Approach to Indexing in Object-Oriented Databases*”, The VLDB Journal, 5(3):215-228, 1996.

#### 1995

20. Y.N. Huang, V. Dahl, and J. Han, “*Fact Updates in Logic Databases: A Meta Programming Approach*”, Int. Journal of Software Eng. & Knowledge Eng., 5(3):467-491, 1995.
21. W. Lu and J. Han, “*Query Evaluation and Optimization in Deductive and Object-Oriented Spatial Databases*”, Information and Software Technology, 37(3):131-143, 1995.
22. J. Han, and L.V.S. Lakshmanan, “*Evaluation of Regular Nonlinear Recursions by Deductive Database Techniques*”, Information Systems, 20(5):419-441, 1995.
23. J. Han, “*Chain-Split Evaluation in Deductive Databases*”, IEEE Transactions on Knowledge and Data Engineering, 7(2):261-273, 1995.
24. H. Kawano, S. Nishio and J. Han, “*Technology of Knowledge Discovery from Database*”, Journal of Japanese Society for Artificial Intelligence, 10(1):38-44, 1995 (in Japanese).
25. W. Lu and J. Han, “*Information Associated Join Index for Spatial Range Search*”, International Journal of Geographical Information Systems, 9(3):221-249, 1995.

26. J. Han, Y. Cai, N. Cercone and Y. Huang, “*Discovery of Data Evolution Regularities in Large Databases*”, *Journal of Computer and Software Engineering* (a special issue on *Methodologies and Tools for Intelligent Information Systems*), 3(1):41-69, 1995.

#### 1994

27. J. Han, “*Towards Efficient Induction Mechanisms in Database Systems*”, *Theoretical Computing Science*, 133:361-385, 1994.
28. W. Y. Lu, D. L. Lee and J. Han, “*A Study on the Structure of Linear Recursions*”, *IEEE Transactions on Knowledge and Data Engineering*, 6(5):723-737, 1994.
29. D. J. Gemmell, J. Han, R. Beaton, and S. Christodoulakis, “*Delay Sensitive Multimedia on Disks*”, *IEEE Multimedia*, 1(3):56-67, 1994.
30. N. Cercone, J. Han, P. McFetridge, F. Popowich, Y. Cai, D. Fass, C. Groeneboer, G. Hall and Y. Huang, “*System X and DBLearn: How to Get More from Your Relational Database, Easily*”, *Integrated Computer-Aided Engineering*, 1(4):311-339, 1994.
31. D. J. Gemmell and J. Han, “*Multimedia Network File Servers: Multi-Channel Delay Sensitive Data Retrieval*”, *ACM/Springer Journal of Multimedia Systems*, 1:240-252, 1994.
32. J. Han, “*Constraint-Based Query Evaluation in Deductive Databases*”, *IEEE Transactions on Knowledge and Data Engineering*, 6(1):96-107, 1994.

#### 1993

33. J. Han, Y. Cai and N. Cercone, “*Data-Driven Discovery of Quantitative Rules in Relational Databases*”, *IEEE Transactions on Knowledge and Data Engineering*, 5(1):29-40, 1993.
34. J. Han, “*Compilation and Evaluation of Linear Mutual Recursions*”, *Information Sciences*, 69:157-183, 1993.

#### 1992

35. J. Han, “*Binding Propagation Beyond the Reach of Rule/Goal Graphs*”, *Information Processing Letters*, 42(5):263-268, 1992.
36. J. Han and K. Zeng, “*Automatic Generation of Compiled Forms for Linear Recursions*”, *Information Systems*, 17(4):299-322, 1992.
37. J. W. Han and Z. N. Li, “*Deductive-ER: Deductive Entity-Relationship Model and Its Data Language*”, *Information and Software Technology*, 34(3):192-204, 1992.
38. J. W. Han, “*On the Power of Query-Independent Compilation*”, *Int. Journal of Software Eng. & Knowledge Eng.*, 2(2):277-292, 1992.
39. C. Youn, H. J. Kim, L. J. Henschen and J. Han, “*Classification and Compilation of Linear Recursive Queries in Deductive Databases*”, *IEEE Transactions on Knowledge and Data Engineering*, 4(1):52-67, 1992.

#### 1991

40. J. Han and L. Liu, “*Efficient Evaluation of Multiple Linear Recursions*”, *IEEE Transactions on Software Engineering*, 17(12):1241-1252, 1991.
41. J. Han and Q. Wang, “*Evaluation of Functional Linear Recursions: A Compilation Approach*”, *Information Systems*, 16(4):463-469, 1991.
42. Y. Cai, N. Cercone and J. Han, “*Learning in Relational Databases: An Attribute-Oriented Approach*”, *Computational Intelligence*, 7(3):119-132, 1991.

## 1990

43. J. Han, “*From Transitive Closure Recursions to Single Chain Recursions*”, *Information Systems*, 15(4):479-488, 1990.

## 1989

44. J. Han and W. Y. Lu, “*Asynchronous Chain Recursions*”, *IEEE Transactions on Knowledge and Data Engineering*, 1(2):185-195, 1989.
45. J. Han, “*Multi-Way Counting Method*”, *Information Systems*, 14(3):219-229, 1989.
46. J. Han, “*Compiling General Linear Recursions by Variable Connection Graph Analysis*”, *Computational Intelligence*, 5(1):12-31, 1989.

### 7.3 Articles Submitted to Refereed Journals

1. K. Wang, Y. He and J. Han, “*Pushing Support Constraints into Association Mining*”, submitted to *IEEE Transactions on Knowledge and Data Engineering*, 2000.
2. J. Han, J. Pei, Y. Yin and R. Mao, “*Mining Frequent Patterns without Candidate Generation: A Frequent-Pattern Tree Approach*”, submitted to *Data Mining and Knowledge Discovery: An International Journal*, 2000.
3. J. Pei, J. Han, and R. Mao, “*Mining Frequent Closed Itemsets: A Frequent-Pattern Growth Approach*”, submitted to *The VLDB Journal*, 2000.
4. J. Pei, J. Han, B. Mortazavi-Asl, H. Pinto, Q. Chen, U. Dayal, and M.-C. Hsu, “*Mining Sequential Patterns Efficiently by Pattern-Growth Methods*”, submitted to *IEEE Transactions on Knowledge and Data Engineering*, 2001.

### 7.4 Selected Publications in Refereed Books and Monographs

#### 2001 (accepted for publication)

1. J. Han, A. K. H. Tung, and J. He, “*SPARC: Spatial Association Rule-based Classification*”, V. Kumar (eds.), *Data Mining for Scientific and Engineering Applications*, Kluwer Academic Publishers, 2001.
2. J. Han, M. Kamber, and A. K. H. Tung, “*Spatial Clustering Methods in Data Mining: A Survey*”, H. Miller and J. Han (eds.), *Geographic Data Mining and Knowledge Discovery*, Taylor and Francis, 2001.
3. Y. Bedard, T. Merrett, and J. Han, “*Fundamentals of Geospatial Data Warehousing for Geographic Knowledge Discovery*”, H. Miller and J. Han (eds.), *Geographic Data Mining and Knowledge Discovery*, Taylor and Francis, 2001.

#### 2000

4. J. Han, O R. Zaïane, S. H. S. Chee, and J. Y. Chiang, “*Towards Online analytical Mining of the Internet for E-Commerce*”, in W. Kou and Y. Yesha (eds.), *Electronic Commerce Technology Trends: Challenges and Opportunities*, IBM Press, 2000, pp. 169-198.
5. J. Han, “*Characteristic Rules*”, W. Klösgen and J. Zytkow (eds.), *Handbook of Data Mining and Knowledge Discovery*, Oxford University Press, 2000.
6. J. Han, “*DBMiner*”, W. Klösgen and J. Zytkow (eds.), *Handbook of Data Mining and Knowledge Discovery*, Oxford University Press, 2000.

7. J. Han, “*Data Mining*”, in J. Urban and P. Dasgupta (eds.), *Encyclopedia of Distributed Computing*, Kluwer Academic Publishers, 2000.

#### 1998

8. J. Han, “*OLAP Mining: An Integration of OLAP with Data Mining*”, in S. Spaccapietra and F. Maryanski (eds.), *Data Mining and Reverse Engineering: Searching for Semantics*”, Chapman & Hall, 1998, pp. 3-20.
9. J. Han, R. T. Ng, Y. Fu, and S. Dao, “*Dealing with Semantic Heterogeneity by Generalization-Based Data Mining Techniques*”, in M. P. Papazoglou and G. Schlageter (eds.), *Cooperative Information Systems: Current Trends & Directions*, Academic Press, 1998, pp. 207-231.

#### 1996

10. J. Han and Y. Fu, “*Exploration of the Power of Attribute-Oriented Induction in Data Mining*”, in U.M. Fayyad, G. Piatetsky-Shapiro, P. Smyth, and R. Uthurusamy (eds.), *Advances in Knowledge Discovery and Data Mining*, AAAI/MIT Press, 1996, pp. 399-421.

#### 1994

11. J. Han, S. Nishio and H. Kawano, “*Knowledge Discovery in Object-Oriented and Active Databases*”, in F. Fuchi and T. Yokoi (eds.), *Knowledge Building and Knowledge Sharing*, Ohmsha, Ltd. and IOS Press, 1994, pp. 221-230. [Also, in *Proc. 1993 Int. Conf. on Building and Sharing of Very Large Scale Knowledge Bases (KB&KS'93)*, Tokyo, Japan, December 1993, pp. 205-214.]
12. X. Hu, N. Cercone and J. Han, “*An Attribute-Oriented Rough Set Approach for Knowledge Discovery in Databases*”, in W.P. Ziarko (eds.), *Rough Sets, Fuzzy Sets and Knowledge Discovery*, Springer-Verlag, 1994, pp. 90-99.

#### 1993

13. J. Han, “*Efficient Deduction and Induction: Key to the Success of Data-Intensive Knowledge-Base Systems*”, in V.S. Alagar, L.V.S. Lakshmanan and F. Sadri (eds.), *Formal Methods in Databases and Software Engineering*, Springer-Verlag, 1993, pp. 139-157.

#### 1992

14. J. Han and W. Y. Lu, “*Compilation and Evaluation of Asynchronous Chain Recursions in Deductive Databases*”, in W. Kim, Y. Kambayashi and I.S. Paik (eds.), *Database Systems for Next-Generation Applications: Principles and Practice*, World Scientific, 1992, pp. 28-40.

#### 1991

15. C. C. Low, H. Lu, B. C. Ooi and J. Han, “*Efficient Access Methods in Deductive and Object-Oriented Databases*”, in C. Delobel, M. Kifer and Y. Masunaga (eds.), *Deductive and Object-Oriented Databases (Lecture Notes in Computer Science 566)*, (*Proc. 2nd Int. Conf., DOOD'91*, Munich, Germany, Dec. 1991), Springer Verlag, 1991, pp. 68-84.
16. J. Han and Q. Wang, “*Efficient Evaluation of Linear Recursions with Function Symbols in Deductive Databases*”, in Z.W. Ras (ed.), *Methodologies for Intelligent Systems, 6*, (*Lecture Notes in Artificial Intelligence 542*), (*Proc. 6th Int. Symp. on Methodologies for Intelligent Systems*, Charlotte, NC, October 1991), Springer Verlag, 1991, pp. 132-141.
17. J. Han, “*On the Power of Query Independent Compilation*”, in F. Dehne and F. Fiala and W.W. Koczkodaj (eds.), *Advances in Computing and Information—ICCI'91 (Lecture Notes in Computer Science, 497)*, (*Proc. Int. Conf. on Computing and Information*, Ottawa, Canada, May 1991), Springer Verlag, 1991, pp. 185-196,

18. Y. Cai, N. Cercone and J. Han, “*Attribute-Oriented Induction in Relational Databases*”, in G. Piatetsky-Shapiro and W. J. Frawley (eds.), **Knowledge Discovery in Databases**, AAAI/MIT Press, 1991, pp. 213-228. (An early version was published in *Proc. IJCAI-89 Workshop on Knowledge Discovery in Databases*, Detroit, MI, August 1989, pp. 26-36.)

## 1990

19. J. Han, Y. Cai and N. Cercone, “*Discovery of Quantitative Rules from Large Databases*”, in Z.W. Ras, M. Zemankova and M.L. Emrich (eds.), **Methodologies for Intelligent Systems**, 5, Elsevier Science, 1990, pp. 157-165.
20. J. Han and L. J. Henschen, “*The Level-Cycle Merging Method*”, in W. Kim, J-M. Nicolas and S. Nishio (Eds.), **Deductive and Object-Oriented Databases**, Elsevier Science, 1990, pp. 65-81. (Also, in *Proc. 1st Int. Conf. on Deductive and Object-Oriented Databases (DOOD’89)*, Kyoto, Japan, December 1989, pp. 113-129).
21. Y. Cai, N. Cercone and J. Han, “*Learning Characteristic Rules from Relational Databases*”, in Gardin and G. Mauri (eds.), **Computational Intelligence**, II, (*Proc. Int. Symp. on Computational Intelligence 89*, Milano, Italy, September 1989), Elsevier Science, 1990, pp. 187-196.

## 1980s

22. J. Han and L. Liu, “*Processing Multiple Linear Recursions*”, in E. L. Lusk and R.A. Overbeek (Eds.), **Logic Programming (Proc. 1989 North America Conf. on Logic Programming**, Cleveland, Ohio, October 1989), MIT Press, 1989, pp. 816-830.
23. J. Han and J. L. Han, “*Recognition of Bounded Linear Recursions*”, in Z. W. Ras (Ed.), **Methodologies for Intelligent Systems**, 4, Elsevier Science, 1989, pp. 199-208.
24. J. Han and Z. N. Li, “*DERDL—A Knowledge-Based Data Language for a Deductive Entity-Relationship Model*”, in R. Janicki and W.W. Koczkodaj (Eds.), **Computing and Information**, Elsevier Science, 1989, pp. 317-326.
25. J. Han and W. S. Luk, “*What Kinds of Recursions Can Be Processed by Transitive Closure Strategies?*”, in Z. W. Ras and L. Saitta (Eds.), **Methodologies for Intelligent Systems**, 3, Elsevier Science, 1988, pp. 170-179.

## 7.5 Selected Publications in Refereed Conference Proceedings

### 2001

1. S. H. S. Chee, J. Han, and K. Wang, “*RecTree: An Efficient Collaborative Filtering Method*”, **Proc. 2001 Int. Conf. on Data Warehouse and Knowledge Discovery (DaWaK’01)**, Munich, Germany, Sept. 2001.
2. J. Han, J. Pei, G. Dong, and K. Wang, “*Efficient Computation of Iceberg Cubes with Complex Measures*”, **Proc. 2001 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD’01)**, Santa Barbara, CA, May 2001, pp. 1-12. (Also, **ACM SIGMOD RECORD**, 30(3), 2001).
3. J. Pei, J. Han, B. Mortazavi-Asl, H. Pinto, Q. Chen, U. Dayal, and M.-C. Hsu, “*PrefixSpan: Mining Sequential Patterns Efficiently by Prefix-Projected Pattern Growth*”, **Proc. 2001 Int. Conf. on Data Engineering (ICDE’01)**, Heidelberg, Germany, April 2001, pp. 215-224.
4. A. K. H. Tung, J. Hou, and J. Han, “*Spatial Clustering in the Presence of Obstacles*”, **Proc. 2001 Int. Conf. on Data Engineering (ICDE’01)**, Heidelberg, Germany, April 2001, pp. 359-367.

5. J. Pei, J. Han, and L. V. S. Lakshmanan, “*Mining Frequent Itemsets with Convertible Constraints*”, Proc. 2001 Int. Conf. on Data Engineering (ICDE'01), Heidelberg, Germany, April 2001, pp. 433-432.
6. A. K. H. Tung, J. Han, L. V. S. Lakshmanan, and R. T. Ng, “*Constraint-Based Clustering in Large Databases*”, Proc. 2001 Int. Conf. on Database Theory (ICDT'01), London, U.K., Jan. 2001, pp. 405-419.

## 2000

7. K. Wang, Y. He and J. Han, “*Mining Frequent Itemsets Using Support Constraints*”, Proc. 2000 Int. Conf. on Very Large Data Bases (VLDB'00), Cairo, Egypt, Sept. 2000, pp. 43-52.
8. E. D. Kim, J. M. W. Lam, and J. Han, “*AIM: Approximate Intelligent Matching for Time Series Data*”, Proc. 2000 Int. Conf. on Data Warehouse and Knowledge Discovery (DaWaK'00), Greenwich, U.K., Sept. 2000, pp. 347-357.
9. J. Han, J. Pei, B. Mortazavi-Asl, Q. Chen, U. Dayal, M.-C. Hsu, “*FreeSpan: Frequent Pattern-Projected Sequential Pattern Mining*”, Proc. 2000 Int. Conf. on Knowledge Discovery and Data Mining (KDD'00), Boston, MA, August 2000, pp. 355-359.
10. J. Pei and J. Han “*Can We Push More Constraints into Frequent Pattern Mining?*”, Proc. 2000 Int. Conf. on Knowledge Discovery and Data Mining (KDD'00), Boston, MA, August 2000, pp. 350-354.
11. J. Han, J. Pei, and Y. Yin, “*Mining Frequent Patterns without Candidate Generation*”, Proc. 2000 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD'00), Dallas, TX, May 2000, pp. 1-12. (Also, ACM SIGMOD RECORD, 29(3):1-12, 2000).
12. O. R. Zaiane and J. Han, “*Finding Spatial Associations in Images*”, Proc. 2000 Data Mining and Knowledge Discovery: Theory, Tools, and Technology II, SPIE Int. Symp. Aerospace/Defense Sensing Simulation and Controls (SPIE'00), Orlando, FL, April 2000, pp. 138-147.
13. J. Pei, J. Han, B. Mortazavi-Asl, and H. Zhu, “*Mining Access Pattern efficiently from Web logs*”, Proc. 2000 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD'00), Kyoto, Japan, April 2000, pp. 396-407.
14. A. K. H. Tung, J. Hou, and J. Han, “*COE: Clustering with Obstacles Entities, A Preliminary Study*”, Proc. 2000 Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD'00), Kyoto, Japan, April 2000, pp. 165-168.
15. O. R. Zaiane, J. Han, and H. Zhu, “*Mining Recurrent Items in Multimedia with Progressive Resolution Refinement*”, Proc. 2000 Int. Conf. on Data Engineering (ICDE'00), San Diego, CA, Feb. 2000, pp. 461-470.

## 1999

16. L. Feng, H. Lu, J. X. Yu, and J. Han, “*Exploiting Templates to Make Multi-Dimensional Inter-Transaction Association Rules Mining Practical*”, Proc. 1999 Int. Conf. on Information and Knowledge Management (CIKM'99), Kansas City, Missouri, Nov. 1999, pp. 225-233.
17. A. K. H. Tung, H. Lu, J. Han, and L. Feng, “*Breaking the Barrier of Transactions: Mining Inter-Transaction Association Rules*”, Proc. 1999 Int. Conf. on Knowledge Discovery and Data Mining (KDD'99), San Diego, CA, Aug. 1999, pp. 297-301.
18. X. Zhou, D. Truffet, and J. Han, “*Efficient Polygon Amalgamation Methods for Spatial OLAP and Spatial Data Mining*”, Proc. 6th Int. Symp. on Large Spatial Databases (SSD'99), Hong Kong, July 1999, pp. 167-187.

19. L. V. S. Lakshmanan, R. Ng, J. Han and A. Pang, “*Optimization of Constrained Frequent Set Queries with 2-Variable Constraints*”, Proc. 1999 ACM-SIGMOD Conf. on Management of Data (SIGMOD’99), Philadelphia, PA, June 1999, pp. 157-168. (Also, ACM SIGMOD RECORD, 28(3):157-168, 1999).
20. J. Han, G. Dong and Y. Yin, “*Efficient Mining of Partial Periodic Patterns in Time Series Database*”, Proc. 1999 Int. Conf. on Data Engineering (ICDE’99), Sydney, Australia, March 1999, pp. 106-115.

## 1998

21. O. R. Zaïane, J. Han, Z.-N. Li, and J. Hou, “*Mining Multimedia Data*”, Proc. CASCON’98: Meeting of Minds, Toronto, Canada, November 1998, pp. 83-96.
22. J. Han, W. Gong, and Y. Yin, “*Mining Segment-Wise Periodic Patterns in Time-Related Databases*”, Proc. 1998 Int. Conf. on Knowledge Discovery and Data Mining (KDD’98), New York City, NY, Aug. 1998, pp. 214-218.
23. K. Koperski, J. Han, and N. Stefanovic, “*An Efficient Two-Step Method for Classification of Spatial Data*”, Proc. 1998 Int. Symp. on Spatial Data Handling (SDH’98), Vancouver, BC, Canada, July 1998, pp. 45-54.
24. R. Ng, L. V. S. Lakshmanan, J. Han and A. Pang, “*Exploratory Mining and Pruning Optimizations of Constrained Associations Rules*”, Proc. 1998 ACM-SIGMOD Conf. on Management of Data (SIGMOD’98), Seattle, Washington, June 1998, pp. 13-24. (Also, ACM SIGMOD RECORD, 27(3):13-24, 1998).
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28. J. Han, “*OLAP Mining: An Integration of OLAP with Data Mining*”, Proc. 1997 IFIP Conference on Data Semantics (DS-7), Leysin, Switzerland, Oct. 1997, pp. 1-11.
29. M. Kamber, J. Han, and J. Y. Chiang, “*Metarule-Guided Mining of Multi-Dimensional Association Rules Using Data Cubes*”, Proc. 1997 Int. Conf. on Knowledge Discovery and Data Mining (KDD’97), Newport Beach, CA, Aug. 1997, pp. 207-210.

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30. D. Cheung, J. Han, V. T. Ng, A. W. Fu and Y. Fu, “*A Fast Distributed Algorithm for Mining Association Rules*”, in Proc. 1996 Int. Conf. on Parallel and Distributed Information Systems (PDIS’96), Miami Beach, Florida, USA, Dec. 1996, pp. 31-44.
31. J. Han, Y. Fu, W. Wang, J. Chiang, W. Gong, K. Koperski, D. Li, Y. Lu, A. Rajan, N. Stefanovic, B. Xia, O. R. Zaïane, “*DBMiner: A System for Mining Knowledge in Large Relational*

*Databases*”, in Proc. 1996 Int. Conf. on Data Mining and Knowledge Discovery (KDD’96), Portland, Oregon, August 1996, pp. 250-255.

32. D. Cheung, J. Han, V. Ng and C.Y. Wong, “*Maintenance of Discovered Association Rules in Large Databases: An Incremental Updating Techniques*”, in Proc. 1996 Int. Conf. on Data Engineering (ICDE’96), New Orleans, Louisiana, USA, Feb. 1996, pp. 106-114.

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33. Z. Xie and J. Han, “*Normalization and Compilation of Deductive and Object-Oriented Database Programs for Efficient Query Evaluation*”, in Proc. 1995 Int. Conf. on Deductive and Object-Oriented Databases (DOOD’95), Singapore, December 1995, pp. 264-279.
34. J. Han, “*Mining Knowledge at Multiple Concept Levels*”, (invited and refereed), in Proc. 4th Int. Conf. on Information and Knowledge Management (CIKM’95), Baltimore, Maryland, Nov. 1995, pp. 19-24.
35. J. Han and Y. Fu, “*Discovery of Multiple-Level Association Rules from Large Databases*”, in Proc. 1995 Int. Conf. on Very Large Data Bases (VLDB’95), Zürich, Switzerland, September 1995, pp. 420-431.
36. O. R. Zaïane and J. Han, “*Resource and Knowledge Discovery in Global Information Systems: A Preliminary Design and Experiment*”, Proc. 1st Int. Conf. on Knowledge Discovery and Data Mining (KDD’95), Montreal, Canada, Aug. 1995, pp. 331-336.
37. K. Koperski and J. Han, “*Discovery of Spatial Association Rules in Geographic Information Databases*”, in Proc. 4th Int. Symp. on Large Spatial Databases (SSD’95), Maine, Aug. 1995, pp. 47-66.
38. J. Han, O. R. Zaïane, and Y. Fu, “*Resource and Knowledge Discovery in Global Information Systems: A Scalable Multiple Layered Database Approach*”, Proc. of IEEE Advances in Digital Libraries (ADL’95), McLean, Virginia, May 1995.

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39. J. Han, L. Liu and Z. Xie, “*LogicBase: A Deductive Database System Prototype*”, in Proc. 3rd Int. Conf. on Information and Knowledge Management (CIKM’94), Gaithersburg, Maryland, Nov. 1994, pp. 226-233.
40. Y.-N. Huang, V. Dahl, and J. Han, “*Incremental Processing of Logic Database Relations*”, in Proc. 1994 Int. Symp. on Methodologies for Intelligent Systems (ISMIS’94), Charlotte, North Carolina, October 1994.
41. D.W. Cheung, A. W.-C. Fu and J. Han, “*Knowledge Discovery in Databases: A Rule-Based Attribute-Oriented Approach*”, in Proc. 1994 Int. Symp. on Methodologies for Intelligent Systems (ISMIS’94), Charlotte, North Carolina, October 1994, pp. 164-173.
42. R. Ng and J. Han, “*Efficient and Effective Clustering Method for Spatial Data Mining*”, in Proc. 1994 Int. Conf. on Very Large Data Bases (VLDB’94), Santiago, Chile, September 1994, pp. 144-155.
43. Z. Xie and J. Han, “*Join Index Hierarchies for Supporting Efficient Navigations in Object-Oriented Databases*”, in Proc. 1994 Int. Conf. on Very Large Data Bases (VLDB’94), Santiago, Chile, September 1994, pp. 522-533.
44. H. Kawano, S. Nishio, J. Han, and T. Hasegawa, “*How Does Knowledge Discovery Cooperate with Active Database Techniques in Controlling Dynamic Environment?*”, in Proc. 5th Int. Conf. on Database and Expert Systems Applications (DEXA’94), Athens, Greece, September 1994, pp. 370-379.

45. Y.-N. Huang, V. Dahl, and J. Han, “*Rule Updates in Logic Databases: A Meta Programming Approach*”, in Proc. of 3rd Pacific Rim Int. Conf. on Artificial Intelligence (PRICAI'94), Beijing, China, August 1994.
46. H. Kawano, S. Nishio, J. Han, and T. Hasegawa, “*Towards an Integration of Knowledge Discovery in Databases with Active Databases Techniques*”, in Proc. 8th Annual Conf. of JSAI (Japanese Society of Artificial Intelligence), pp. 509-512, Tokyo, June 1994. (Excellent paper award).
47. J. Han, Y. Fu, and R. Ng, “*Cooperative Query Answering Using Multiple Layered Databases*”, in Proc. 2nd Int. Conf. on Cooperative Information Systems (CoopIS'94), Toronto, Canada, May 1994, pp. 47-58.
48. Z. Xie and J. Han, “*Optimization of Queries Containing Complex Selections, Joins and Aggregations in Object-Oriented Databases*”, in Proc. 6th Int. Conf. on Computing and Information (ICCI'94), Peterborough, Ontario, Canada, May 1994.

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49. J. Han and Y. Fu, “*Knowledge Discovery and Constraint-Based Processing in Automated Manufacturing*”, in Proc. 2nd IEEE Conf. on Control Applications, Vancouver, Canada, Sept. 1993, pp. 691-696.
50. X. Hu, N. Cercone and J. Han, “*Object Aggregation and Cluster Identification: A Knowledge Discovery Approach*”, in Proc. 3rd Int. Conf. for Young Computer Scientists, Beijing, China, July 1993.
51. X. Hu, N. Cercone and J. Han, “*Discovery of Knowledge Associated with Concept Hierarchy in Database*”, in Proc. 3rd Int. Conf. for Young Computer Scientists, Beijing, China, July 1993.
52. L.V.S. Lakshmanan, K. Ashraf and J. Han, “*Homomorphic Tree Embeddings and Their Applications to Recursive Program Optimization*”, in Proc. 1993 Conf. on Logic in Computer Science (LICS'93), Montreal, Quebec, June 1993, pp. 344-353.
53. J. Han, K. Zeng and T. Lu, “*Normalization of Linear Recursions in Deductive Databases*”, in Proc. 9th Int. Conf. on Data Engineering (ICDE'93), Vienna, Austria, Apr. 1993, pp. 559-567.

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54. J. Han, Y. Cai, N. Cercone and Y. Huang, “*DBLearn: A Knowledge Discovery System for Large Databases*”, in Proc. 1st Int. Conf. on Information and Knowledge Management (CIKM'92), Baltimore, Maryland, Nov. 1992, pp. 473-481.
55. J. Han, Y. Cai and N. Cercone, “*Knowledge Discovery in Databases: An Attribute-Oriented Approach*”, in Proc. 1992 Int. Conf. on Very Large Data Bases (VLDB'92), Vancouver, Canada, August 1992, pp. 547-559.
56. W. Lu and J. Han, “*Deductive Spatial Query Optimization by Dynamic Connection Graph Transformation*”, in Proc. 5th Int. Symp. on Spatial Data Handling (SSDH'92), Charleston, SC, August 1992, pp. 323-334.
57. J. Han, “*Compilation-Based List Processing in Deductive Databases*”, in Proc. Int. Conf. on Extending Database Technology (EDBT'92), Vienna, Austria, March 1992, pp. 104-119. (A. Pirotte et. al. (Eds.), Extending Database Technology—EDBT'92 (Lecture Notes in Computer Science 580)) Springer-Verlag, 1992).
58. W. Lu and J. Han, “*Distance-Associated Join Index for Spatial Range Search*”, in Proc. 8th Int. Conf. on Data Engineering (ICDE'92), Tempe, AZ, Feb. 1992, pp. 284-292.

59. J. Han, *Chain-Split Evaluation in Deductive Databases*, in Proc. 8th Int. Conf. on Data Engineering (ICDE'92), Tempe, AZ, Feb. 1992, pp. 376-384.

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60. J. Han, "*Efficient Evaluation of Linear Mutual Recursions in Deductive Databases*", in Proc. 3rd Int. Conf. on Software Engineering and Knowledge Engineering (SEKE'91), Chicago, Illinois, June 1991, pp. 199-204.
61. J. Han, "*Constraint-Based Reasoning in Deductive Databases*", in Proc. 7th Int. Conf. on Data Engineering (ICDE'91), Kobe, Japan, April 1991, pp. 257-265.

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62. W. Lu and J. Han, "*Decomposition of Spatial Database Queries by Deduction and Compilation*", in Proc. 4th Int. Symp. on Spatial Data Handling (SSDH'90), Zurich, Switzerland, July 1990, pp. 579-588.
63. X. Xu, J. Han and W. Lu, "*RT-Tree: An Improved R-Tree Indexing Structure for Temporal Spatial Databases*", in Proc. 4th Int. Symp. on Spatial Data Handling (SSDH'90), Zurich, Switzerland, July 1990, pp. 1040-1049.
64. W.S. Luk, W. Zhang and J. Han, "*Path: An Approach to Incorporate List Processing in a Relational Database*", in Proc. 2nd Int. Conf. on Software Engineering and Knowledge Engineering (SEKE'90), Chicago, Illinois, June 1990, pp. 189-194.
65. Y. Cai, N. Cercone and J. Han, "*An Attribute-Oriented Approach for Learning Classification Rules from Relational Databases*", in Proc. 6th Int. Conf. on Data Engineering (ICDE'90), Los Angeles, CA, February 1990, pp. 281-288.

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66. J. N. Han, Don Epley and J. Han, "*Compiling Search Constraints for Deductive and Recursive Databases*", in Proc. 2nd Int. Symp. on Artificial Intelligence, Monterrey, Mexico, October 1989.
67. J. Han, L. J. Henschen and N. Zhuang, "*Derivation of Magic Sets by Compilation*", in Proc. 1st Int. Conf. on Software Engineering and Knowledge Engineering (SEKE'89), Chicago, Illinois, June 1989, pp. 164-171.
68. J. Han and W. Y. Lu, "*N-Chain Recursion: the Core of General Linear Recursions*", in Proc. 1st Int. Computer Science Conf., Artificial Intelligence: Theory and Applications, Hong Kong, December 1988, pp. 649-656.
69. Z. N. Li and J. Han, "*Empirical Comparisons of Evidential Reasoning Mechanisms*", in Proc. 1st Int. Symp. on Artificial Intelligence, Monterrey, Mexico, October 1988, pp. 241-252. (co-recipient: The distinguished paper award).
70. J. Han, "*Selection of Processing Strategies for Different Recursive Queries*", in Proc. 3rd Int. Conf. on Data and Knowledge Bases, Jerusalem, Israel, June 1988, pp. 59-68. (C. Beeri, J.W. Schmidt and U. Dayal (eds.), Morgan Kaufmann, 1988).
71. C. Youn, L. J. Henschen and J. Han, "*One-Directional Recursive Formulas*", in Proc. 3rd Int. Conf. on Data and Knowledge Bases, Jerusalem, Israel, June 1988, pp. 69-78. (C. Beeri, J.W. Schmidt and U. Dayal (eds.), Morgan Kaufmann, 1988).
72. J. Han, L. J. Henschen and W. Y. Lu, "*Search Strategies for Finding Partial Answers in Large Knowledge-Bases*", in Proc. 7th Canadian AI Conf., Edmonton, Canada, June 1988, pp. 184-190.

73. C. Youn, L. J. Henschen and J. Han, “*Classification of Recursive Formulas in Deductive Databases*”, in Proc. 1988 ACM-SIGMOD Conf. on Management of Data, Chicago, IL, June 1988. (Also, ACM SIGMOD RECORD, 17(3):320-328, 1988).
74. J. Han, G. Qadah and C. Chaou, “*The Processing and Evaluation of Transitive Closure Queries*”, In Proc. Int. Conf. on Extending Database Technology (EDBT’88), Venice, Italy, March 1988), pp. 49-75. (J.W. Schmidt, S. Ceri and M. Missikoff (Eds.), Extending Database Technology—EDBT’88 (Lecture Notes in Computer Science, 303) Springer-Verlag, 1988).
75. S. Lee and J. Han, “*Semantic Query Optimization in Recursive Databases*”, in Proc. 4th Int. Conf. on Data Engineering (ICDE’88), Los Angeles, CA, February 1988, pp. 444-451.
76. J. Han and L. J. Henschen, “*Handling Redundancy in the Processing of Recursive Database Queries*”, in Proc. 1987 ACM-SIGMOD Conf. on Management of Data, San Francisco, CA, May 1987. (Also, ACM SIGMOD RECORD, 16(2):73-81, 1987.)
77. J. Han and H. Lu, “*Some Performance Results on Recursive Query Processing in Relational Database Systems*”, in Proc. 2nd Int. Conf. on Data Engineering (ICDE’86), Los Angeles, CA, February 1986, pp. 533-541. (The best student paper award (K.S. Fu award)).
78. J. Han and L. Travis, “*Using Expert Knowledge in Database-Oriented Problem Solving*”, in Proc. 6th Int. Conf. on Information Systems, Indianapolis, IN, December 1985, pp. 237-254.
79. J. Han and L. Travis, “*Knowledge-Directed Recursive Rule Compilation in Expert Database Systems*”, in Proc. 2nd IEEE Conf. on Artificial Intelligence Applications, Miami, FL, December 1985, pp. 137-141.

## 7.6 Workshop Papers, Invited Papers, and Other Selected Publications

### 2001

1. J. Pei, A. K. H. Tung, and J. Han, “*Fault-Tolerant Frequent Pattern Mining: Problems and Challenges*”, Proc. 2001 ACM-SIGMOD Int. Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD’01), Santa Barbara, CA, May 2001.
2. J. Han, H. Jamil, Ying Lu, L. Chen, Y. Liao, and J. Pei, “*DNA-Miner: A System Prototype for Mining DNA Sequences*”, Proc. 2001 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD’01), Santa Barbara, CA, May 2001, (system demonstration). (Also, ACM SIGMOD RECORD, 30(3), 2001).

### 2000

3. A. K. H. Tung, R. Ng, L. V. S. Lakshmanan, and J. Han, “*Geo-Spatial Clustering with User-Specified Constraints*”, Proc. Workshop on Multimedia Data Mining (associated with 2000 Int. Conf. on Knowledge Discovery and Data Mining) (MDM’00), Boston, MA, Aug. 2000.
4. H. Miller and J. Han, *Discovering Geographic Knowledge in Data Rich Environments: A Report on a Specialist Meeting*, SIGKDD Explorations 1(2): 105-107, 2000.
5. J. Pei, J. Han, and R. Mao, “*CLOSET: An Efficient Algorithm for Mining Frequent Closed Itemsets*”, Proc. 2000 ACM-SIGMOD Int. Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD’00), Dallas, TX, May 2000, pp. 11-20.

### 1999

6. E. Kim, J. Han, J. Hou, K. Hu, W. Jin, J. Li, B. Mortazavi-Asl, H. Pinto, J. Pei, A. Tung, Z. Wang, H. Zhu, “*DBMiner: Integration of Data Mining Research and Development*”, Proc. 1999 Knowledge Mining Workshop in the Real World”, Tokyo, Japan, Dec. 1999.

7. J. Han, Q. Yang, and E. Kim, “*Plan Mining by Divide-and-Conquer*”, Proc. 1999 SIGMOD Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'99), Philadelphia, PA, May 1999, pp. 8:1-8:6.
8. R. Ng, L. V. S. Lakshmanan, J. Han, and T. Mah, “*Exploratory Mining via Constrained Frequent Set Queries*”, Proc. 1999 ACM-SIGMOD Conf. on Management of Data (SIGMOD'99), Philadelphia, PA, June 1999, (system demonstration), pp. 556-558. (Also, ACM SIGMOD RECORD, 28(3):556-558, 1999).
9. O. R. Zaïane, E. Hagen, and J. Han, “*Word Taxonomy for On-Line Visual Asset Management and Mining*”, Proc. Int. Workshop on Application of Natural Language to Information Systems (NLDB'99), Klagenfurt, Austria, June 1999, pp. 271-276.

#### 1998

10. O. R. Zaïane and J. Han, “*WebML: Querying the World-Wide Web for Resources and Knowledge*”, Proc. Int. Workshop on Web Information and Data Management (WIDM'98), Bethesda, Maryland, Nov. 1998, pp. 9-12.
11. R. Ng, J. Han, and L. V. S. Lakshmanan, Editorial notes for Special Issue on SIGMOD-97 Data Mining Workshop, *Data Mining and Knowledge Discovery*, 2:231-232, 1998.
12. J. Han, S. Chee, and J. Y. Chiang, “*Issues for On-Line Analytical Mining of Data Warehouses*”, Proc. 1998 SIGMOD Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'98), Seattle, Washington, June 1998, pp. 2:1-2:5.
13. H. Lu, J. Han, and L. Feng, “*Stock Movement and N-Dimensional Inter-Transaction Association Rules*”, Proc. 1998 SIGMOD Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'98), Seattle, Washington, June 1998, pp. 12:1-12:7.
14. O. R. Zaïane, J. Han, Z. N. Li, J. Y. Chiang, and S. Chee, “*MultiMedia-Miner: A System Prototype for MultiMedia Data Mining*”, Proc. 1998 ACM-SIGMOD Conf. on Management of Data (SIGMOD'98), Seattle, Washington, June 1998, (system demonstration), pp. 581-583. (Also, ACM SIGMOD RECORD, 27(3):581-583, 1998).

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15. J. Han, L. V. S. Lakshmanan, and R. T. Ng, Editorial notes for Special Issue on Data Mining, *Journal of Intelligent Information Systems*, 9:5-6, 1997.
16. J. Han, K. Koperski, and N. Stefanovic, “*GeoMiner: A System Prototype for Spatial Data Mining*”, Proc. 1997 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD'97), Tucson, Arizona, May 1997 (system demonstration), pp. 553-556. (Also, ACM SIGMOD RECORD, 26(3):553-556, 1997).
17. J. Han, “*Data Mining: Where Is It Heading?*”, (Panel abstract), Proc. 1997 Int. Conf. Data Engineering (ICDE'97), Birmingham, England, April 1997, p. 462.
18. M. Kamber, L. Winstone, W. Gong, and J. Han, “*Generalization and Decision Tree Induction: Efficient Classification in Data Mining*”, Proc. 1997 Int. Workshop on Research Issues in Data Engineering (RIDE'97), Birmingham, England, April 1997, pp. 111-120.

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19. J. Han, Y. Fu, W. Wang, J. Chiang, O. R. Zaïane, and K. Koperski, “*DBMiner: Interactive Mining of Multiple-Level Knowledge in Relational Databases*”, Proc. 1996 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD'96), Montreal, Canada, June 1996 (System demonstration), pp. 553-556. (Also, ACM SIGMOD RECORD, 25(3):553-556, 1996.)

20. K. Koperski, J. Adhikary and J. Han, “*Spatial Data Mining: Progress and Challenges*”, Proc. 1996 SIGMOD Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'96), pp. 55-70, Montreal, Canada, June 1996.
21. J. Han, Y. Fu, W. Wang, K. Koperski, and O. R. Zaïane, “*DMQL: A Data Mining Query Language for Relational Databases*”, Proc. 1996 SIGMOD Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'96), pp. 27-33, Montreal, Canada, June 1996.
22. K. Koperski and J. Han, “*Data Mining Methods for the Analysis of Large Geographic Databases*”, in Proc. 10th Annual Conference on GIS, Vancouver, Canada, March 1996.

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23. Y. Fu and J. Han, “*Meta-Rule-Guided Mining of Association Rules in Relational Databases*”, in Proc. 1995 Int. Workshop. on Knowledge Discovery and Deductive and Object-Oriented Databases (KDOOD'95), Singapore, December 1995, pp. 39-46.
24. D. Cheung and J. Han, “*Maintenance of Discovered Knowledge: A Strategy for Updating Association Rules (abstract)*”, in Proc. 1995 Int. Workshop. on Knowledge Discovery and Deductive and Object-Oriented Databases (KDOOD'95), Singapore, December 1995, pp. 58-60.
25. J. Han, Y. Fu and S. Tang, “*Advances of the DBLearn System for Knowledge Discovery in Large Databases*”, (video demonstration), Proc. 1995 Int. Joint Conf. on Artificial Intelligence (IJCAI'95), Montreal, Canada, Aug. 1995, pp. 2049-2050.

#### 1994

26. J. Han and Y. Fu, “*Dynamic Generation and Refinement of Concept Hierarchies for Knowledge Discovery in Databases*”, Proc. AAAI'94 Workshop on Knowledge Discovery in Databases (KDD'94), Seattle, WA, July 1994, pp. 157-168.
27. J. Han, Y. Fu, Y. Huang, Y. Cai, and N. Cercone, “*DBLearn: A system prototype for knowledge discovery in relational databases*”, Proc. 1994 ACM-SIGMOD Int. Conf. on Management of Data (SIGMOD'94), Minneapolis, MN, May 1994 (System prototype demonstration), p. 516. (Also, ACM SIGMOD RECORD, 23(3):516, 1994.)

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28. J. Han, L. Liu and Z. Xie, “*LogicBase: A System Prototype for Deductive Query Evaluation*”, in Proc. 1993 ILPS (Int. Logic Programming Symp.) Workshop on “Programming with Logic Databases”, Vancouver, Canada, October 1993, pp. 146-160.
29. J. Han, and L.V.S. Lakshmanan, “*Evaluation of Regular Nonlinear Recursive Programs*”, (a poster paper), in Proc. 1993 Int. Logic Programming Symp. (ILPS'93), Vancouver, Canada, October 1993.
30. S. Nishio, H. Kawano and J. Han, “*Knowledge Discovery in Object-Oriented Databases: The First Step*”, in Proc. 1993 AAAI Workshop on Knowledge Discovery in Databases (KDD'93), Washington D.C., July 1993, pp. 186-198.
31. W. Lu, J. Han and B. C. Ooi, “*Discovery of General Knowledge in Large Spatial Databases*”, in Proc. 1993 Far East Workshop on Geographic Information Systems (FEGIS'93), Singapore, June 1993, pp. 275-289.

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32. J. Han and T. Lu, “*N-Queens Problem Revisited: A Deductive Database Approach*”, in Proc. 1992 IJCSLP (Int. Joint Conf. and Symp. on Logic Programming) Workshop on Deductive Databases, Washington D.C., Nov. 1992, pp. 48-55.

33. L. Liu and J. Han, “*Compressed Counting Method*”, in Proc. 1992 IJCSLP (Int. Joint Conf. and Symp. on Logic Programming) Workshop on Deductive Databases, Washington D.C., Nov. 1992, pp. 76-85.
34. J. Han, Y. Cai and N. Cercone, “*Knowledge Discovery in Large Databases*”, (Invited), in Proc. Computer World’92 (2nd Int. Symp.), Kobe, Japan, Nov. 1992, pp. 60-67.
35. J. Han, “*What Kind of Knowledge Can Be Discovered in Databases?*”, (Invited), in Proc. Symp. on Conceptual Construction and Knowledge Acquisition in Knowledge Science—Learning and Discovery of Knowledge in Man-Machine, Tokyo, Japan, Oct. 1992, pp. 5-14.
36. J. Han, *Chain-Based Evaluation—A Bridge Linking Recursive and Nonrecursive Query Evaluation*, in Proc. Int. Workshop on Research Issues on Data Engineering: Transaction and Query Processing (RIDE’92), Tempe, AZ, Feb. 1992, pp. 132-139.

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37. J. Han, “*Is It Possible to Capture More Bindings than Magic Rule Rewriting?*”, in Proc. 1991 ILPS (Int. Logic Programming Symp.) Workshop on Deductive Databases, San Diego, CA, October 1991, pp. 10-19.
38. J. Han, Y. Cai and N. Cercone, “*Concept-Based Data Classification in Relational Databases*”, in Proc. 1991 AAAI Workshop on Knowledge Discovery in Databases (KDD’91), Anaheim, CA, July 1991, pp. 77-94.

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39. J. Han, Y. Cai and N. Cercone, “*Support of Efficient Deduction and Induction Mechanisms in Data-Intensive Knowledge-Base Systems*”, in Proc. AAAI-90 Workshop on Knowledge Base Management Systems (KBMS’90), Boston, MA, July 1990, pp. 41-45.

### 7.7 Patents in Application

1. J. Pei, J. Han, H. Pinto, B. Mortazavi-Asl, Q. Chen, U. Dayal, and M.-C. Hsu, “*Systems and Methods for Efficient Mining of Sequential Patterns by Sequential Pattern Growth*”, Application for U.S. Patent, Aug. 2000.
2. J. Han, J. Pei, Y. Yin, and R. Mao, “*Mining Frequent Patterns without Candidate Generation: A Frequent-Pattern Growth Method*”, Application for U.S. Patent, October 1999. (Filed Jan. 3, 2000 with serial number 60/174,166).