

# Jiawei Han

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## Education

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

## Work Experience

- Endowed University Professor, (9/1999 — 8/2004), **Simon Fraser Univ.**, B.C., Canada.
- Research Director, (1/1997 — present), **DBMiner Technology Inc.**, B.C., Canada.
- Professor, (9/1995 — present), Computing Science, **Simon Fraser Univ.**, B.C., Canada.
- Senior Industrial Research Fellow, (5/1993 — 4/1994), **MPR Teltech Ltd.**, B.C., Canada.
- Associate Professor, (9/1991 — 8/1995), Computing Science, **Simon Fraser U.**, B.C., Canada.
- Assistant Professor, (8/1987 — 8/1991), Computing Science, **Simon Fraser U.**, B.C., Canada.
- Assistant Professor, (1/1986 — 7/1987), Electrical Engineering and Computer Science, **Northwestern Univ.**, Illinois, U.S.A.

## Awards and Honors

- Appointed as an **Endowed University Professor** by Simon Fraser University, one of six Endowed University Professorships in the University.
- **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** (1994–2001), **Who's Who in Science and Engineering** (1994–2001), and **Who's Who in the West** (1994–2001), *Marquis Who's Who, A Reed Reference Publishing Company*.

## Major Research and Professional Achievements

- **Data mining and data warehousing**: One of the pioneers in the field, ACM SIGKDD supervisory committee member, 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), chief architect of **DBMiner** system, published widely, invited speaker or tutor in many international conferences, journal subject/associate editor for three major journals in the field, attracted industry contracts and grants from Boeing, HP Lab, IBM, London Drugs, Tamden Computers, Hughes Research Lab., MPR Teltech, etc.
- **Web technology**: Focused on Web data warehousing and Web mining, chief designer of **WebLogMiner** and **WebMiner**, 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.
- **Spatial data mining**: 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).
- **Multimedia data mining**, a chief designer of **MultiMediaMiner** (ACM-SIGMOD'98 demo).
- **Deductive and object-oriented databases**, over 100 research papers published in this area, chief architect of a deductive database system, **LogicBase** (ACM-SIGMOD'94 demo).

## Research Grants Awarded (1998 — )

- NSERC (Natural Science and Engineering Research Council of Canada): Operating grant (1987–2003), current project: Data Mining in Data Warehouses, Advanced Database Systems, and World-Wide Web, principal investigator, \$38,850/yr for four years (April'99 — March'03).

- Canada Networks of Centres of Excellence, IRIS (Institute of Robotics and Intelligent Systems), IRIS3, 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).
- 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).
- **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).
- 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.) (January'99 — December'99).
- 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).

## Professional Activities (1995—)

### • Subject or associate editor

IEEE Transactions on Knowledge and Data Engineering, Journal of Data Mining and Knowledge Discovery, and International Journal of Intelligent Information Systems.

### • Conference and workshop organization

ACM-SIGKDD (supervisory committee member), 2000 ACM SIGMOD Int. Conf. on Management of Data (SIGMOD'00) (demo and exhibits chairman), 1999 Int. Conf. Knowledge Discovery and Data Mining (KDD'99) (tutorial chairman), 1997 Int. Conf. Data Engineering (ICDE'97) (panel co-ordinator), 1996 Int. Conf. Knowledge Discovery and Data Mining (KDD'96) (program committee co-chairman), SIGMOD'96 and SIGMOD'97 Workshops on Research Issues on Data Mining and Knowledge Discovery (DMKD'96 & '97) (workshop co-organizer), Int. Workshop on Integration of Knowledge Discovery and Deductive and Object-Oriented Databases (KDOOD'95) (workshop co-organizer), 1995 Int. Conf. Data Engineering (ICDE'95) (vice PC chairman).

### • Program committee member

Int. Conf. Very Large Databases (VLDB'2000/96), Int. Conf. Extending Data Base Technology (EDBT'2000), ACM SIGMOD Int. Conf.'s Management of Data (SIGMOD'99/96), Int. Conf.'s Data Engineering (ICDE'99/98/95), Int. Conf.'s Data Mining and Knowledge Discovery (KDD'96-99), Int. Symp.'s Large Spatial Databases (SSD'99/97), ACM SIGMOD Workshop Research Issues on Data Mining and Knowledge Discovery (DMKD'96-00), Int. Conf. Information and Knowledge Management (CIKM'99/97/96/75), Int. Symp. Database Systems for Advanced Applications (DASFAA'99/95), and many others.

### • Tutorials for international conf./symp./workshops

1998 Pacific-Asia Conf. Knowledge Discovery and Data Mining (PAKDD-98), (Melbourne, Australia); 1997 Int. Symp. Large Spatial Databases (SSD'97) (Berlin, Germany), 1997 Int. Conf. Data Engineering (ICDE'97) (Birmingham, England), 1996 Int. Conf. Cooperative Information Systems (CoopIS'96) (Brussels, Belgium), 1996 ACM SIGMOD Int. Conf. Management of Data (SIGMOD'96) (Montreal, Canada), 1995 Int. Conf. Data Engineering (ICDE'95) (Taipei, Taiwan).

### • Invited speeches for international conf./symp./workshops

(Invited tutor) UCLA Extension Short Course: Data Mining (L.A., California, 1998—1999); (Invited tutor) IBM Chair Short Course on Data Mining (Antwerp, Belgium, 1999); (Invited tutor) IBM China Summer Course on Data Mining and Data Warehousing (Shanghai, China, 1998); 1998 Int. Database Engineering and Applications Symp. (IDEAS-98), (Cardiff, England); 1998 IEEE Advances in Digital Libraries Conf. (ADL-98) (Santa Barbara, CA, 1998); 1998 Pacific-Asia Conf. Knowledge Discovery and Data Mining (PAKDD-98) (Melbourne, Australia, 1998); 7th IFIP 2.6 Working Conference on Database Semantics (DS-7), Searching for Semantics: Data Mining, Reverse Engineering, etc. (Leysin, Switzerland, 1997); NASA-CESDIS Workshop on Data Mining, Data Warehousing, and High Performance Computing (Greenbelt, MD, 1997); Microsoft Research and Univ. of Washington, Summer Institute of Data Mining (Seattle, WA, 1997); Data Mining and Beyond (Portland, Oregon, 1996); CIKM'95 (Baltimore, Maryland, 1995).

### • Seminar and/or invited talks in universities and industry firms

Univ. Minnesota ('99), Univ. B. C. ('99), UCLA ('99), UC Riverside ('99), Univ. Michigan ('99), JPL ('99), Distinguished lecture, CS, U. Alberta ('98), Rutgers U. ('98), IFIP W2.6 Workshops ('98,'96), Boeing ('97), IBM Canada ('97), Bellcore ('96), Informix ('96), MPR Teltech Ltd. ('96,'93), MacDonald Dettwiler & Associates ('98,'96,'93), Seagate Software ('97,'96), Northwestern U. ('96,'94), U. Alberta ('95,'91), McGill U. ('95), Concordia U. ('95), U.

of Hong Kong ('95), Chinese U. of Hong Kong ('95), Hong Kong PolyTech U. ('95), Hong Kong U. Science & Technology ('95).

## Training of Highly Qualified Personnel (Ph.D.'s and MSc's)

- Current graduate students (as senior-supervisor): 6 Ph.D. and 14 M.Sc. students, all working on data mining, data warehousing, and/or Web technology.
- Graduate degrees conferred (as sole senior-supervisor): 21 M.Sc.'s and 8 Ph.D.'s.
- Visiting scholars supervised: over 10 (from Australia, Canada, China, Japan, Germany, Hong Kong, and Singapore).

## Research Publications

### Selected Research Journal Publications (1996 — )

1. 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.
2. H. Lu, J. Han, and L. Feng, "Beyond Intra-Transaction Association Analysis: Mining Multi-Dimensional Inter-Transaction Association Rules", accepted by *ACM Transactions on Information Systems*, January 1999.
3. N. Stefanovic, J. Han, and K. Koperski, "Object-Based Selective Materialization for Efficient Implementation of Spatial Data Cubes," accepted by *IEEE Transactions on Knowledge and Data Engineering*, October 1998.
4. J. Han, "Towards On-Line Analytical Mining in Large Databases", *ACM-SIGMOD Record* (invited and refereed), 27(1):97-107, 1998.
5. K. Koperski, J. Han, and J. Adhikary, "Mining Knowledge in Geographical Data", accepted by *Communications of ACM*, 1998.
6. 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.
7. 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.
8. 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.
9. J. Han, L. Liu and T. Lu, "Evaluation of Declarative N-Queens Recursion: A Deductive Database Approach", *Information Sciences*, 105:69-100, 1998.
10. M.-S. Chen, J. Han, and P.S. Yu, "Data Mining: An Overview from Database Perspective", *IEEE Trans. Knowledge and Data Engineering*, 8(6):866-883, 1996.
11. J. Han, Y. Huang, N. Cercone, and Y. Fu, "Intelligent Query Answering by Knowledge Discovery Techniques", *IEEE Trans. Knowledge and Data Engineering*, 8(3): 373-390, 1996.
12. B. C. Ooi, J. Han, H. Lu, and K. L. Tan, "Index-Nesting — An Efficient Approach to Indexing in Object-Oriented Databases", *The VLDB Journal*, 5(3):215-228, 1996.

### Books and (Edited) Conference Proceedings (1996 — )

1. J. Han and M. Kamber, **Data Mining: Concepts and Techniques**, Morgan Kaufmann Publishers, (to be published in 2000).
2. H. Miller and J. Han (eds.), **Geographic Data Mining and Knowledge Discovery**, Taylor and Francis, (to be published in 2000).
3. J. Han (ed.), **Tutorial Notes for ACM SIGKDD 1999 International Conference on Knowledge Discovery and Data Mining**, ACM Press, 1999.
4. 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.
5. E. Simoudis, J. Han, and U. Fayyad (eds.), **Proceedings of the 2nd Int. Conf. on Data Mining and Knowledge Discovery**, AAAI Press, August 1996.

### Selected Articles in Refereed Conference Proceedings and Monographs (1998 — )

1. J. Han, J. Pei, and Y. Yin, "Mining Frequent Patterns without Candidate Generation", *Proc. 2000 ACM-SIGMOD Conf. on Management of Data (SIGMOD'00)*, Dallas, TX, May 2000.
2. 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.
3. 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.

4. O. R. Zaïane, 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, March 2000.
5. L. Feng, H. Lu, J. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. J. Han, "Characteristic Rules", and "DBMiner", in Handbook of Data Mining and Knowledge Discovery, W. Klösgen and J. Zytkow (eds.), Oxford University Press, 1999.
11. 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.
12. K. Koperski, J. Han, and N. Stefanovic, "An Efficient Two-Step Method for Classification of Spatial Data", Proc. 1998 Int. Symp. Spatial Data Handling, Vancouver, BC, July 1998, pp. 45-54.
13. 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.
14. R. Ng, L. V. S. Lakshmanan, J. Han and A. Pang, "Exploratory Mining and Pruning Optimizations of Constrained Associations Rules", in Proc. 1998 ACM-SIGMOD Int. Conf. Management of Data, Seattle, Washington, June 1998, pp. 13-24.
15. O. R. Zaïane, M. Xin, J. Han, "Discovering Web Access Patterns and Trends by Applying OLAP and Data Mining Technology on Web Logs," Proc. Advances in Digital Libraries Conf., Santa Barbara, CA, April 1998, pp. 19-29.

#### Selected Articles in Refereed Workshop Proceedings (1998 — )

1. 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.
2. J. Han, Q. Yang, and E. Kim, "Plan Mining by Divide-and-Conquer", Proc. 1999 SIGMOD'99 Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'99), Philadelphia, PA, May 1999, pp. 8:1-8:6.
3. 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.
4. 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.
5. 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.
6. J. Han, S. Chee, and J. Y. Chiang, "Issues for On-Line Analytical Mining of Data Warehouses", Proc. 1998 SIGMOD'98 Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'98), Seattle, Washington, June 1998, pp. 2:1-2:5.
7. H. Lu, J. Han, and L. Feng, "Stock Movement and N-Dimensional Inter-Transaction Association Rules", Proc. 1998 SIGMOD'98 Workshop on Research Issues on Data Mining and Knowledge Discovery (DMKD'98), Seattle, Washington, June 1998, pp. 12:1-12:7.
8. 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.

#### Patent in Application (1998 — )

1. J. Han, J. Pei, and Y. Yin, Mining Frequent Patterns without Candidate Generation: A FP-Tree-Based Frequent Pattern Growth Method, Application for U.S. Patent, October 1999.