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Alexander Tuzhilin

Research Interests

Knowledge Discovery in Databases (Data Mining), Personalization Technologies and Customer Relationship Management, Temporal Databases, Development of IS Methods for Modeling Business Processes

Education

New York University, Courant Institute of Mathematical Sciences
Ph.D. in Computer Science, October 1989

Stanford University, Department of Management Science and Engineering (formerly, EES Department), M.S. in Engineering Economics, October 1981

New York University, B.A. in Mathematics, June 1980

Regular Academic Positions

New York University, Stern School of Business

Associate Professor of Information Systems (1996 – present)

Assistant Professor of Information Systems (1989 – 1996)

Visiting Positions

The Wharton School, Department of Operations and Information Management, University of Pennsylvania, Visiting Associate Professor, September 2001 – August 2002

Columbia University, Computer Science Department
Visiting Scientist, September 1997 – August 1998

Ecole Nationale Superieure des Telecommunications, Paris, France
Visiting Scientist, March 1994 – August 1994

Industrial Positions

Bell Laboratories, Lucent Technologies.
Consultant, April 1995 – December 1996

Information Builders, Inc., New York, N.Y.
Systems Developer, September 1985 – August 1987

Major Services Performed at the Stern School

Ph.D. Program Coordinator for the IS Department (2000 – 2001, 2003 -)

Director of the Master of Science in Information Systems Program (joint program between Computer Science and the Stern School) (1996 – 2001)

Faculty Council Member of the Stern School (2001 – 2003)

Grant Support

NSF Grant ``Knowledge Discovery in Temporal Databases,'' Principal Investigator, 1994 – 1997

Center for Advanced Technologies, NYU, 1:1Pro Project, 1998

Center for Research in Information Systems, Stern School of Business, NYU, The e-Butler Project, 1998.

Center for Information Intensive Organizations, NYU, Personalization Technologies for 1:1 Marketing Applications, 1999.

Morgan Stanley Dean Witter "The ARTE Project", 2000 – 2001.

Pfizer, Inc., Pharmaceutical Applications of Data Mining, 2002.

Stern School of Business, NYU, Multidimensional Recommender Systems, 2002.

Stern School of Business, NYU, Development of a Recommendation Query Language for Multidimensional Recommender Systems, 2003.

Stern School of Business, NYU, Model Management for Statistical and Data Mining Models, 2004.

Patents

"System and Method for Dynamic Profiling of Users in One-to-One Applications." US Patent #6,236,978.

"System and Method for Dynamic Profiling of Users in One-to-One Applications and for Validating User Rules." US Patent #6,871,186.

"Method for Determining Actionable Patterns in a Database." US Patent #6,292,797.

"Method and Apparatus for Monitor, Search and Notification in a Network." Patent pending.

"System, process and software arrangement for providing multidimensional recommendations/suggestions." Patent pending.

Professional Activities

Editorial Activities:

Member of the Editorial Board of the *Data Mining and Knowledge Discovery* journal (1997 – present)

Member of the Editorial Board of the *IEEE Transactions on Knowledge and Data Engineering* (2002 – present)

Member of the Editorial Board of *the Electronic Commerce Research Journal* (2000 - present)

Associate Editor of the *INFORMS Journal on Computing* (2000 – present)

Member of the Editorial Board of the *Journal of the Association for Information Systems* (1999 - 2002)

Guest Co-Editor of the Special Issue of the *IEEE Transactions on Knowledge and Data Engineering* "Customer Relationship Management: Data Mining Meets Marketing" (scheduled publication date: April 2007)

Guest Co-Editor of the Special Issue of the *Informs Journal on Computing* on Mining Web-based Data for e-Business Applications, Vol. 15, No. 2, 2003.

Guest Editor of the special issue of the *Decision Support Systems* journal on knowledge discovery and its applications to business. Vol. 21, 1997.

Member of the Editorial Advisory Board of and wrote a foreword to the *Encyclopedia of Data Warehousing and Mining,* John Wang (ed.), IDEA Group, 2005.

Organizing Committee Member

International Workshop on Customer Relationship Management: Data Mining Meets Marketing, *Workshop Co-Chair (with Russ Winer),* 2005.

IEEE International Conference on Data Mining, *Program Committee Co-Chair,* 2003.

IEEE International Conference on Data Mining, *Best Paper Awards Committee Chair,* 2003.

ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, *Panels Chair,* 2000.

Program Committee Member *(in chronological order):*

Fifth IEEE International Conference on Data Mining, New Orleans, November, 2005.

Workshop on Information Technologies and Systems (WITS), Las Vegas, December 2005.

Third IJCAI Workshop on Intelligent Techniques in Web Personalization, August 2005, Edinburgh, Scotland.

Tenth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Seattle, WA, August 2004.

Workshop on Information Technologies and Systems (WITS), Washington, DC, December 2004.

SIGMOD Workshop on Research Issues in Data Mining and Knowledge Discovery, Paris, France, June 2004.

AAAI Workshop on Semantic Web Personalization, San Jose, July 2004.

Workshop on Information Technologies and Systems (WITS), Seattle, WA, December 2003.

Ninth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Washington, DC, August 2003.

IJCAI-03 Workshop on Intelligent Techniques for Web Personalization, Acapulco, Mexico, August 2003.

NSF/NIJ Symposium on Intelligence and Security Informatics, Tucson, AZ, June 2003.

IEEE International Conference on Data Mining, Japan, December 2002

SIAM Data Mining Conference, Arlington, VA, April 2002.

Eighth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Alberta, CA, July 2002.

Workshop on Information Technologies and Systems (WITS), Barcelona, Spain, December 2002.

Ninth International Symposium on Temporal Representation and Reasoning (TIME), July, 2002.

27th International Conference on Very Large Databases, Rome, Italy, September 11 – 14, 2001

Seventh International Conference on Knowledge Discovery and Data Mining, San Francisco, August 20 – 23, 2001.

International Workshop on Bioinformatics in Data Mining (BIOKDD 2001), San Francisco, August 2001.

Eight International Symposium on Temporal Representation and Reasoning (TIME), Udine, Italy, June 14-16, 2001

4th International Conference on Telecommunications and Electronic Commerce (ICTEC), Dallas, TX, November 8 – 11, 2001.

IJCAI-01 Workshop on Intelligent Techniques for Web Personalization, Seattle, WA, August 2001

First International Workshop on Databases, Documents, and Information Fusion, Magdeburg, Germany, 2001.

3rd International Conference on Telecommunications and Electronic Commerce (ICTEC), Dallas, TX, November 16-19, 2000.

International Workshop on Temporal, Spatial and Spatio-Temporal Data Mining, Lyon, France, September 13 – 16, 2000.

Sixth International Conference on Knowledge Discovery and Data Mining, Boston, August 2000 (Panels Chair, Program Committee Member)

WebKDD'2000 Workshop, Boston, MA, August 2000.

WebKDD’99 Workshop, San Diego, CA, August 1999.

SIGMOD'99 Data Mining Workshop, Philadelphia, May, 1999.

1st International Workshop on Evolution and Change in Data Management, Versailles, France, November, 1999.

Pacific Rim Workshop on Data Mining and Machine Learning, 1998.

16th International Conference on Conceptual Modeling (ER'98), Singapore 1998.

Fourth International Conference on Knowledge Discovery and Data Mining, New York, N.Y., August 1998.

15th International Conference on Conceptual Modeling (ER'97), Los Angeles, CA, November 1997.

SIGMOD'97 Data Mining Workshop, Tucson, AZ, June 1997.

NSF funding panel, 1997.

Third International Conference on Knowledge Discovery and Data Mining, Newport Beach, CA, August 1997.

Second International Conference on Knowledge Discovery and Data Mining, Portland, Oregon, August 1996.

First International Conference on Knowledge Discovery and Data Mining, Montreal, Canada, August 1995.

International Workshop on Temporal Databases, Zurich, Switzerland, September 1995.

Fifth Workshop on Information Technologies and Systems, Amsterdam, Netherlands, December 1995.

International Workshop on Temporal Reasoning in Deductive and Object-Oriented Databases, Singapore, December 1995.

AAAI Workshop on Knowledge Discovery in Databases, Washington, 1993

Invited Presentations:

Academic: Numerous presentations including those at MIT, Wharton, UCLA, Columbia, NYU, University of Minnesota, University of Maryland (College Park), University of Toronto, University of Florida (Gainesville), University of Texas at Dallas, University of Washington, NJIT, Sorbonne, Moscow State University, Stockholm University and Swedish Royal Institute of Technology, Ecole Nationale Superieure des Telecommunications, Vienna University of Economics and Business, Politecnico di Bari (Italy), and others.

Participation/Presentation in the Dagstuhl Seminars:

-- Data Mining: The Next Generation, July 2004.

-- Temporal Databases: Research and Practice, June 1997.

Participation in the "Architecture of On Demand Business Summit" at IBM T.J. Watson Research Center, May 2004.

Industrial (related to my research): Bell Laboratories (Lucent), IBM Watson Research Center, Telecordia, Oracle, Computer Associates, Doubleclick, Morgan Stanley, Barnes&Noble.com, Merck, CuraGen, Genaissance Pharmaceuticals, CCS (Japan)

Ad Hoc Reviewing:

-- ACM Transactions on Database Systems
-- IEEE Transactions on Knowledge and Data Engineering
-- IEEE Transactions on Software Engineering
-- IEEE Transactions on Systems, Man and Cybernetics
-- IEEE Computer
-- Management Science
-- Information Systems Research
-- Journal of Data Mining and Knowledge Discovery
-- Journal of Intelligent Information Systems
-- Information Systems
-- Artificial Intelligence Journal
-- INFORMS Journal on Computing
-- Decision Support Systems Journal
-- Annals of Operations Research
-- Machine Learning Journal
-- Information Processing Letters
-- Journal of Software Practice and Experience
-- NSF Grant Proposals
-- SIGMOD, VLDB, ECDT, ICDE, KDD, ICDM, ER Conferences.

Ph.D. Student Advising

Dissertation Committee Chair *(chronological order):*

- *Tianyi Jiang* (4th year PhD student); research area: personalization (customer profiling/user modeling)

- *Gedas Adomavicius* (CS Department, NYU). Thesis title: "Expert-Driven Validation of Set-Based Data Mining Results," 2002. G. Adomavicius is currently an Assistant Professor of Information Systems at the Carlson School of Management, *University of Minnesota*.

- *Balaji Padmanabhan*, Thesis title: "Discovery of Unexpected Patterns in Data Mining Applications," 1999. B. Padmanabhan is currently an Assistant Professor at *the Wharton School*, *University of Pennsylvania.*

- *P. Balasubramanian*, Thesis title: "Query-Driven Simulation for Decision Support," 1995. P. Balasubramanian is currently an Assistant Professor at *Boston University*.

***Dissertation Committee Member**:*

- Raghav Madhavan, “Design and Evaluation of Genetic Regression Methods for Knowledge Discovery,” 1999.

- Don Berndt, “Designing a Knowledge Discovery Tool: The AX System," 1997.

- Nicky Ranganathan, “Constraint-Based Environments for Model Formulation and Analysis," 1994

- Hardeep Johar, “Coordination and Control in Distributed Work: Towards Intelligent Decision Support”, 1994.

- Shlomo Hershkop (Computer Science Department, Columbia University), “Behavior-Based Email Analysis with Application to Spam Detection,” 2005 (external thesis committee member).

- Sigal Sahar (Computer Science Department, Tel Aviv University). “What is Interesting: Studies on Interestingness in Knowledge Discovery,” 2003 (external examiner)

- Wenke Lee (Computer Science Department, Columbia University), “A Data Mining Framework for Constructing Features and Models for Intrusion Detection Systems,” 1999, (external thesis committee member).

- Andreas Prodromidis (Computer Science Department, Columbia University) “Management of Intelligent Learning Agents in Distributed Data Mining Systems,” 1999, (external thesis committee member).

- Mauricio Hernandez (Computer Science Department, Columbia University), “A Generalization of Band Joins and the Merge/Purge Problem," March 1996 (external thesis committee member).

- Philip Chan (Computer Science Department, Columbia University), “An Extensible Meta-Learning Approach for Scalable and Accurate Inductive Learning," October 1996 (external thesis committee member).

Courses Taught at NYU

- Advanced Technologies for Business Applications (MBA)

- Customer Relationship Management Systems (MBA)

- Database Management Systems (undergraduate and MBA)

- Fundamentals of Computer Systems (undergraduate)

- Technical Foundations of Information Systems (Ph.D.)

- Computer-Based Systems for Management Support (undergraduate core)

- Ph.D. Seminars

Awards

Outstanding Service Award from the Technical Committee on Computational Intelligence (TCCI) of the IEEE Computer Society, 2003

Dean's Dissertation Fellowship from NYU, September 1988

Fellowship from the Stanford School of Engineering, September 1980

Mathematics Award for Excellence from NYU, June 1980

List of Publications

Journal Publications (in chronological order)

1. "On Characterization and Discovery of Minimal Unexpected Patterns in Rule Discovery." To appear in the **IEEE Transactions on Knowledge and Data Engineering** (with B. Padmanabhan).

2. "Validation Sequence Optimization: A Theoretical Approach." To appear in the **INFORMS Journal on Computing** (with G. Adomavicius).

3. "Personalization Technologies: A Process-Oriented Perspective." **Communications of the ACM**, 48(1), October 2005 (with G. Adomavicius).

4. "Towards the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions." **IEEE Transactions on Knowledge and Data Engineering,** 17(6), June 2005, (with G. Adomavicius).

5. "Incorporating Contextual Information in Recommender Systems Using a Multidimensional Approach". **ACM Transactions on Information Systems,** 23(1), January 2005 (with G. Adomavicius, R. Sankaranarayanan and S. Sen).

6. "On the Use of Optimization for Data Mining: Theoretical Interactions and eCRM Opportunities," **Management Science**, 49(10), October 2003 (with B. Padmanabhan).

7. "e-Butler: An Architecture of a Customer-Centric Personalization System," **International Journal of Computational Intelligence and Applications**, vol. 2, no 3, October 2002 (with G. Adomavicius).

8. "Knowledge Refinement Based on the Discovery of Unexpected Patterns in Data Mining". **Decision Support Systems**, vol. 33, no. 3, July 2002 (with B. Padmanabhan).

9. "Using Data Mining Methods to Build Customer Profiles." **IEEE Computer**; vol. 34, no. 2, February 2001 (with G. Adomavicius).

10. "Expert-Driven Validation of Rule-Based User Models in Personalization Applications." **Data Mining and Knowledge Discovery Journal.** vol. 5, no 1/2, Special Issue on E-commerce and Data Mining, January 2001 (with G. Adomavicius).

11. "Unexpectedness as a Measure of Interestingness in Knowledge Discovery." **Decision Support Systems**, (27)3 (1999) pp. 303-318 (with B. Padmanabhan).

12. "Making Sense of Marketing Data: Some MIS Perspectives on the Analysis of Large Databases," **Journal of Market-Focused Management** (with S. Sen), vol. 3, p. 91–111, 1998.

13. "On the Analysis of Web Site Usage Data: How Much Can We Learn About the Consumer from Web Logfiles?" **European Journal of Marketing**, vol 32, no. 7, 1998 (Special Issue on Marketing in Cyberspace) (with S. Sen, B. Padmanabhan, N. White, R. Stein).

14. "Providing Information Systems Support for Simulations Using the Cassandra+ System." **Annals of Operations Research**, vol. 72, 1997 (with P. Balasubramanian).

15. “What Makes Patterns Interesting in Knowledge Discovery Systems.” **IEEE Transactions of Knowledge and Data Engineering**, vol. 8, no. 6, December 1996 (with Avi Silberschatz).

16. “On Data Representation and Use in a Temporal Relational DBMS". **Information Systems Research** vol. 7, no. 3, September 1996 (with J. Clifford and A. Croker).

17. “Modeling Data-Intensive Reactive Systems with Relational Transition Systems." **Acta Informatica**, vol.33, no.3, May 1996 (with Z. Kedem).

18. “Using Query Driven Simulations for Querying Outcomes of Business Processes.” **Decision Support Systems**, vol. 16, 1996 (with P. Balasubramanian).

19. “On Periodicity in Temporal Databases.” **Information Systems**, vol. 20, no. 8, December 1995 (with J. Clifford).

20. “Templar: A Knowledge-Based Language for Software Specifications Using Temporal Logic.” **ACM Transactions on Information Systems**, vol. 13, no. 3, July 1995.

21. “Extending Temporal Logic to Support High-Level Simulations.” **ACM Transactions on Modeling and Computer Simulation**, vol. 5, no. 2, 1995.

22. “On Completeness of Historical Relational Query Languages.” **ACM Transactions on Database Systems**, vol. 19, no. 1, March 1994 (with James Clifford and Albert Croker)

23. “Querying Datalog Programs with Temporal Logic.” **Acta Informatica**, vol. 30, Dec. 1993.

24. “Abstract-Driven Pattern Discovery in Databases.” **IEEE Transactions of Knowledge and Data Engineering**, vol. 5, no. 6, December 1993 (with V. Dhar).

25. “SimTL: A Simulation Language Based on Temporal Logic.” **Transactions of the Society for Computer Simulation**, vol. 9, no. 2, 1992.

Articles in Non-refereed Journals and Magazines

26. “Automation’s Next Wave.” **Stern Business***, March 2005.*

Submitted Articles

27. “Managing and Analyzing Large Collections of Data Mining Models.” In preparation for the 2nd round of reviews in **Communications of the ACM** (with Bing Liu).

28. “Segmenting Customers from Population to Individuals: Does 1-to-1 Keep your Customers Forever?” Submitted to **IEEE Transactions on Knowledge and Data Engineering** (with T. Jiang).

29. “Improving Personalization Solutions through Optimal Segmentation of Customer Bases”. In the process of being submitted to the **ACM Transactions on Internet Technology** [abstract submitted; full article due: October 15, 2005] (with T. Jiang).

30. “RQL: A Query Language for Customizing Recommendations”. In the process of being submitted to the **ACM Transactions on Internet Technology** [abstract submitted; full article due: October 15, 2005] (with G. Adomavicius and R. Zheng).

In Preparation

31. "Cardinality Predicates and Their Use in Expert-Driven Validations" (with G. Adomavicius). Targeted journal: *IEEE Transactions on Knowledge and Data Engineering.* Targeted submission date: *November 2005.*

32. "The e-Butler Service: Implications for the Marketers" (with S. Sen and G. Adomavicius). Targeted journal: *Journal of Interactive Marketing.* Targeted submission date: *December 2005.*

33. "Building and Querying Large Modelbases" (with B. Liu and J. Hu). Targeted submission date: *October 2005.*

Books

34. **Proceedings of the Third IEEE International Conference on Data Mining** (edited with Jude Shavlik and Xindong Wu), November 2003.

35. **Recent Advances in Temporal Databases**. Springer, September 1995 (edited with James Clifford).

Book Chapters

36. "On Subjective Methods of Knowledge Evaluations in Data Mining." In **Handbook of Data Mining and Knowledge Discovery**. Oxford University Press. 2002.

37. "Minimum Description Length Principle." In **Handbook of Data Mining and Knowledge Discovery**. Oxford University Press. 2002.

38. "Finding Unexpected Patterns in Data." In **Data Retrieval and Data Mining** , T. Y. Lin and N. Cercone (eds), Kluwer Academic Publishers, 2002 (with B. Padmanabhan).

39. "Discovering Unexpected Patterns in Temporal Data Using Temporal Logic." In **Temporal Databases -- Research and Practice**. O. Etzion, S. Jajodia, S. Sripada (eds.). Springer, 1998 (with G. Berger).

40. "On Completeness of Languages for the Grouped and Ungrouped Historical Data Models." In **Temporal Databases**. A. Tansel, J. Clifford, S. Gadia, S. Jajodia, A. Segev, and R. Snodgrass (eds.), Benjamin/Cummings, 1993 (with J. Clifford and A. Croker).

41. "Application of Temporal Databases to Knowledge-Based Simulations." In **Temporal Databases**. A. Tansel, J. Clifford, S. Gadia, S. Jajodia, A. Segev, and R. Snodgrass (eds.), Benjamin/Cummings, 1993.

Major Refereed Conference Proceedings (in chronological order)

(acceptance rates between 7% and 35%; papers with acceptance rates below 15% highlighted)

42. "Mining Actionable Patterns by Role Models". **IEEE International Conference on Data Engineering**, April 2006 (with K. Wang and Y. Jiang). (*acceptance rate 89/456 = 19.5%*)

43. **"**Mining Actions that Respond to Patterns." **IEEE International Conference on Data Mining.** November 2005 (with K. Wang, A. Fu and Y. Jiang) [short paper].

44. "Context-Aware Recommender Systems", **14th Workshop on Information Technologies and Systems (WITS)**, December 2004 (with G. Adomavicius, R. Sankaranarayanan and S. Sen).

45. "Divide and Prosper: Comparing Models of Customer Behavior from Populations to Individuals", **IEEE International Conference on Data Mining**, Nov. 2004 (with T. Jiang) [short paper].

46. "On the Discovery of Significant Statistical Quantitative Rules". **ACM SIGKDD Conference on Knowledge Discovery and Data Mining,** August 2004 (with B. Padmanabhan and H. Zhang) (*acceptance rate 40/337 = 12%*)

47. "Querying Multiple Sets of Discovered Rules," **ACM SIGKDD Conference on Knowledge Discovery and Data Mining,** July 2002 (with Bing Liu). (*acceptance rate 44/307 = 14%*)

48. "Handling Very Large Numbers of Association Rules in the Analysis of Microarray Data," **ACM SIGKDD Conference on Knowledge Discovery and Data Mining,** July 2002 (with Gedas Adomavicius) (*acceptance rate 44/307 = 14%*).

49. "Optimizing Sequences of Validation Operators in Data Mining Applications", **12th Workshop on Information Technologies and Systems (WITS)**, December 2002, Barcelona, Spain (with Gedas Adomavicius).

50. "Multidimensional Recommender Systems: A Data Warehousing Approach." In Proceedings of the **WECOM 2001 Conference**, Lecture Notes in Computer Science 2232, pp. 180 – 192, Springer-Verlag, 2001 (with G. Adomavicius).

51. "Small is Beautiful: Discovering the Minimal Set of Unexpected Patterns." **ACM SIGKDD Conference on Knowledge Discovery and Data Mining,** March 2000 (with B. Padmanabhan). (*acceptance rate 26/248 = 10%*).

52. "User Profiling in Personalization Applications through Rule Discovery and Validation." In **Proceedings of the 5th International Conference on Knowledge Discovery and Data Mining**, August 1999 (with G. Adomavicius) [short paper].

53. "A Belief-Driven Method for Discovering Unexpected Patterns." In **Proceedings of the 4th International Conference on Knowledge Discovery and Data Mining**, August 1998 (with B. Padmanabhan). (*acceptance rate 18/250 = 7%*).

54. "Discovery of Actionable Patterns in Databases: The Action Hierarchy Approach." In **Proceedings of the 3rd International Conference on Knowledge Discovery and Data Mining**, August 1997 (with G. Adomavicius) [short paper].

55. "Discovering Unexpected Rules in Data Mining Applications." In **Proceedings of the Workshop on Information Technologies and Systems (WITS),** 1997 (with B. Padmanabhan).

56. "Pattern Discovery in Temporal Databases: A Temporal Logic Approach." In **Proceedings of the 2nd International Conference on Knowledge Discovery and Data Mining**, August 1996 (with B. Padmanabhan) [short paper].

57. “On Subjective Measures of Interestingness in Knowledge Discovery.” In **Proceedings of the 1st International Conference on Knowledge Discovery and Data Mining**, August 1995 (with A. Silberschatz) [short paper].

58. “A Temporal Relational Algebra as a Basis for Temporal Relational Completeness." In **Proceedings of the 16th International Conference on Very Large Data Bases**, Brisbane, Australia, August 1990 (with J. Clifford).

59. “Relational Database Behavior: Utilizing Relational Discrete Event Systems and Models.” In **Proceedings of 8th ACM Symposium on Principles of Database Systems**, Philadelphia, PA, March 1989 (with Z. Kedem).

60. “Querying and Controlling the Future Behavior of Complex Objects.” In **Proceedings of IEEE Fifth International Conference on Data Engineering**, Los Angeles, CA, February 1989 (with Z. Kedem).

61. “A Semantic Approach to Correctness of Concurrent Transaction Executions." In **Proceedings of ACM Symposium on Principles of Database Systems**, March 1985 (with P. Spirakis).

Other Refereed Publications

62. “Incorporating Context into Recommender Systems Using Multidimensional Rating Estimation Methods.” In Proceedings of the **First International Workshop on Web Personalization, Recommender Systems and Intelligent User Interfaces,** October 2005 (with G. Adomavicius).

63. “Analyzing Microarray Data Using Association Rules”, **Proceedings of the ASDD Symposium**, July 2005 (with G. Adomavicius).

64. “Extending Recommender Systems: A Multidimensional Approach”, **Proceedings of the IJCAI Workshop on Intelligent Techniques for Web Personalization**, August 2001 (with G. Adomavicius).

65. “Integrating User Behavior and Collaborative Methods in Recommender Systems.” **On-Line Proceedings of the CHI Workshop on Recommender Systems**, May 1999 (with G. Adomavicius).

66. “Pattern Discovery in Temporal Databases: Some recent Results,” **Proceedings of the AAAI Workshop on Predicting the Future: AI Approaches to Time Series Analysis**, May 1998.

67. “A Pattern Discovery Algebra.” In **Proceedings of the ACM-SIGMOD Workshop on Research Issues in Data Mining and Knowledge Discovery**, May 1997.

68. “User-Assisted Knowledge Discovery: How Much Should the User be Involved?” In **Proceedings of the ACM-SIGMOD Workshop on Research Issues on Data Mining and Knowledge Discovery**, May 1996 (with A. Silberschatz).

69. “On Temporal Grouping.” In **Proceedings of the International Workshop on Temporal Databases**, September 1995, Zurich, Switzerland (with James Clifford, Albert Croker, and Fabio Grandi).

70. “Grouped and Ungrouped Historical Data Models: Expressive Power and Completeness.” In **Proceedings of the International Workshop on an Infrastructure for Temporal Databases**, June, 1993 (with James Clifford and Albert Croker).

71. “Comparison of Approaches for Modeling Dynamics of Databases." In **Proceedings of the 4th International Workshop on Foundations of Models and Languages for Data and Objects: Modeling Database Dynamics**, Volkse, Germany, October 1992.

72. “Temporal Logic as a Simulation Language.” In **Proceedings of the International Conference on Artificial Intelligence and Simulation**, New Orleans, Louisiana, April, 1991.

73. “Production System Approach to Predicting and Controlling Future Behavior of Complex Systems.” In **Proceedings of IEEE International Computer Science Conference; Artificial Intelligence: Theory and Applications**, Hong Kong, December 1988 (with Z. Kedem).

Working Papers

74. “The e-Butler service, or has the age of electronic personal decision making assistants arrived?” Working paper IS-98-16, Center for Research on Information Systems, Stern School of Business, NYU, 1998.

75. “A Belief-Driven Discovery Framework based on Data Monitoring and Triggering.” Working Paper IS-96-26, Stern School of Business, NYU; December 1996 (with A. Silberschatz).

76. “A Query-Driven Approach to Executable Specifications.” Technical Report 94D015, Ecole Nationale Superieure des Telecommunications, Paris, France, 1994 (with P. Balasubramanian)

77. “On the Expressive Power of Infinite Temporal Databases.” Working Paper IS-92-16, Stern School of Business, NYU; April, 1992 (with G. Kuper).

78. “Temporally Active Databases := Active Databases + Time.” Working Paper IS-91-43, Stern School of Business, NYU; December, 1991.

79. ``Validating Requirements Specifications Stated in Knowledge Representation Language Templar." Working Paper IS-91-28, Stern School of Business, NYU; December, 1991.

Significant Articles in Popular Press about my Work

80. “A method of collecting consumer data renews questions about patents on business practices,” by Sabra Chartrand, *New York Times,* July 30, 2001.

81. “Consumer profiling: A battle over patents,” *International Herald Tribune;* overview of the Chartrand’s NYT article, July 31, 2001.

82. “Stop the Press! A Patent on One to One?” by Don Peppers, *Inside 1to1*; December 17, 2001

Revised: September 2005.