

AYHAN DEMIRIZ

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Education

- **Rensselaer Polytechnic Institute**—Troy, NY
Ph.D. in Department of Decision Sciences & Engineering Systems,
 - Thesis Title: "Learning with Capacity Control: A Semi-supervised Approach"
 - Advisor: Prof. Kristin P. Bennett
 - GPA: 3.70/4.00, Graduated in June, 2000
- **Rensselaer Polytechnic Institute**—Troy, NY
M.Sc. in Industrial and Management Engineering, Department of Decision Sciences & Engineering Systems,
 - Concentration: Information Systems
 - GPA: 3.67/4.00, Graduated in May, 1996
- **Istanbul Technical University**—Istanbul, Turkey
B.Sc., Department of Industrial Engineering
 - GPA: 3.15/4.00, Graduated in June, 1993
 - Senior Thesis: "A Management Game for Production Companies"

Work Experience

- **Department of Industrial Engineering, Gebze Technical University**—Turkey
Professor: October, 2016 –Present
 - Department Chair (appointment ended in July, 2021), Teaching Undergraduate and Graduate Courses
- **Verikar Software**—Turkey
Founder: October, 2015 – Present
 - Location Based Merchandising Price Information System - www.kacaapp.com
 - Used Car Pricing System - www.otokaca.com
 - Academic Consulting - Various Companies in Logistics and Hospitality Sectors
- **Department of Industrial Engineering, Sakarya University**—Turkey
Associate Professor: November, 2008 – September, 2016
 - Teaching Undergraduate and Graduate Courses
 - Supervising M.Sc. and Ph.D. students
- **Department of Electrical Engineering and Computer Science, UCI Irvine**,—CA, USA
Visiting Professor: April, 2011 – November, 2011
 - Research in Applying Optimization in the area of Network-on-Chips (NOC)
- **Graduate School of Natural and Engineering Sciences**—Sakarya University, Turkey
Vice Dean: January, 2010 – January, 2013
 - Various Administrative Responsibilities and Editing Institute Journal

- **Department of Industrial Engineering, Sakarya University—Turkey**
Assistant Professor: August, 2005 – November, 2008
 - Teaching Introduction to Data Mining,
 - Introduction to Artificial Intelligence and Expert Systems,
 - Algorithms and Programming,
 - Principles of Manufacturing Systems Engineering (Graduate Course).
- **Department of Industrial Engineering, Sakarya University—Turkey**
Principal Investigator: November, 2007 – November, 2010
 - Research Project "A Data-Mining Driven Markdown Management System Prototype for Turkish Apparel Industry"
 - Funded by Turkish Scientific & Technological Research Council (TUBITAK)
 - For the duration of 36 months with a budget of approximately 175K NTL (around \$145K)
- **Department of Computer Science, University College of London—United Kingdom**
Visiting Researcher: Summer, 2007
 - Funded by EU PASCAL Network of Excellence.
- **Department of Industrial Engineering, Işık University—Turkey**
Part-time Instructor: March, 2006 – January, 2007
 - Taught Operations Research I,
 - Operations Research III (Stochastic Models in OR),
 - Probability.
- **Department of Industrial Engineering, Sakarya University—Turkey**
Instructor: November, 2004 – August, 2005
 - Taught Introduction to Data Mining,
- **Verizon Inc. Information Technology Department—Irving, TX, USA**
Senior Software Engineer: January, 2001– September, 2004
 - Code development using C++ and SQL for the following projects
 - Customer Relationship Management (CRM)
 - Product Recommendation
 - Association Mining
 - Click Stream Analysis
 - Web Mining
 - Bundling Analysis
- **Department of Mathematical Sciences, Rensselaer Polytechnic Institute—Troy, NY**
Post-Doctoral Research: September, 2000 – December, 2000
 - Funded by NSF project "The Automated Design and Discovery of Novel Pharmaceuticals using Semi-Supervised Learning in Large Molecular Databases".
- **Rensselaer Polytechnic Institute—Troy, NY**
Graduate Research Assistantship: September, 1998 – June, 2000
 - Funded by Prof. Kristin P. Bennett.

- **GE Corporate R&D**—Niskayuna, NY
Graduate Research Assistantship: September, 1997 – September, 1998
 - Worked with Data Mining Group for various GE companies
 - Time Series Analysis
 - Soft Computing Applications
 - Data preparation for analysis / SAS programming
 - Statistical data analysis (regression, clustering etc.)
 - Decision tree analysis (Knowledge Seeker)
 - SAS macro programming for Web applications
- **Chase Manhattan Mortgage Corporation**—Metro Park, NJ
Summer Intern: Summer, 1997
 - SAS programming for data analysis
 - Creating database used for predicting prepayments

Publications

- **Refereed Journal Papers**
 - Adak, Z., Demiriz, A.. *Hybridization of population-based ant colony optimization via data mining*. Journal of Intelligent Data Analysis, vol. 24, no. 2, pp. 291-307, 2020. DOI: 10.3233/IDA-184431
 - Turker, T., Demiriz, A.. *An Integrated Approach for Shift Scheduling and Rostering Problems with Break Times for Inbound Call Centers*. Mathematical Problems in Engineering, vol. 2018, Article ID 7870849, 19 pages, 2018. DOI: 10.1155/2018/7870849.
 - Demiriz, A., Ekizoglu, B.. *Fuzzy rule-based analysis of spatio-temporal ATM usage data for fraud detection and prevention*. Journal of Intelligent & Fuzzy Systems, DOI: 10.3233/JIFS-169012, 2016.
 - Demiriz, A.. *Using Pairwise Associations for Multi-item Markdown Optimisation*. International Journal of Systems Science: Operations & Logistics, DOI: 10.1080/23302674.2015.1094835, 2015.
 - Demiriz, A., Bagherzadeh, N., Alhusein, A.. *Using Constraint Programming for the Design of Network-on-Chip Architectures*. Computing, DOI: 10.1007/s00607-013-0359-4, 2015.
 - Demiriz, A., Bagherzadeh, N., Ozturk, O.. *Voltage island based heterogeneous NoC design through constraint programming*. Computers & Electrical Engineering, DOI: 10.1016/j.compeleceng.2014.08.005, 2014.
 - Demiriz, A., Ertek, G., Atan, T., and Kula, U.. *Re-Mining Item Associations: Methodology and a Case Study in Apparel Retailing*. Journal of Decision Support Systems, Volume 52, Issue 1, December 2011, Pages 284-293.
 - Demiriz, A., Kula, U., and Akbilek, N.. *A Framework for Balanced Service and Cross-Selling by Using Queuing Science*. Journal of Intelligent Manufacturing Systems, Volume 20 Number 2: 249-257, April 2009.
 - Demiriz, A.. *Enhancing Product Recommender Systems on Sparse Binary Data*. Journal of Data Mining and Knowledge Discovery, Volume 9, Issue 2, September 2004, Pages 147 - 170

- Rätsch, G., Demiriz, A., Bennett, K.P. *Sparse Regression Ensembles in Infinite and Finite Hypothesis Spaces*. Special Issue of Journal of Machine Learning on "New Methods for Model Selection and Model Combination", Y. Bengio and D. Schuurmans Eds. Volume 48:193-221, 2002. Kluwer Academic Publishers.
- Demiriz, A., Bennett, K.P., Shawe-Taylor, J.. *Linear Programming Boosting via Column Generation*. Special Issue of Journal of Machine Learning on "Support Vector Machines and Kernel Methods", N. Cristianini, C. Campbell and C. Burges Eds. Volume 46:225-254, 2002. Kluwer Academic Publishers.
- Demiriz, A., Bennett, K.P., Embrechts, M.J.. *A Genetic Algorithm Approach for Semi-supervised Clustering*. Journal of Smart Engineering System Design, 4:35-44, 2002. Taylor & Francis.

• **Refereed Conference Papers**

- Demiriz, A., Ahangari H., and Ozturk O.. Temperature-Aware Core Mapping for Heterogeneous 3D NoC Design Through Constraint Programming. In the Proceedings of 28th Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP) 2020. Sweden. DOI: 10.1109/PDP50117.2020.00054
- Demiriz, A.. Used Car Pricing and Beyond: A Survival Analysis Framework. In the Proceedings of First International Conference on Artificial Intelligence for Industries - ai4i 2018, 26-28 September, 2018. Laguna Hills, CA, USA.
- Demiriz, A. and Cantaş, F.. Analyzing used-car web listings via text mining Framework. In the Proceedings of First International Conference on Internet of Things and Machine Learning, IML 2017, Liverpool, United Kingdom, October 17-18, 2017.
- Turker, T., Demiriz, A.. An MIP model to schedule the call center workforce and organize the breaks. In the 2nd International Conference on Mathematical Sciences and Statistics (ICMSS2016), February, 2016. Kuala Lumpur, Malaysia.
- Demiriz, A.. A Web-based Decision Support System for Used-Car Pricing. In the Proceedings of Third International Conference On Advances in Computing, Control and Networking - ACCN'15 28-29 December, 2015 Bangkok, Thailand.
- Demiriz, A., Ekizoglu, B.. Using Location Aware Business Rules for Preventing Retail Banking Frauds. In the Proceedings of First International Conference on Anti-Cybercrime (ICACC-2015), November, 2015. Riyadh, Saudi Arabia.
- Ekizoglu, B., Demiriz, A.. Fuzzy Rule-Based Analysis of Spatio-Temporal ATM Usage Data for Fraud Detection and Prevention. In Proceedings of 12th International Conference on Fuzzy Systems and Knowledge Discovery (FSKD'15) , August, 2015. Zhangjiajie, China
- Demiriz, A.. Demand Forecasting based on Pairwise Item Associations. In Proceedings of Complex Adaptive Systems 2014, November, 2014.
- Demiriz, A., and Kaynak, S.. Using Survival Analysis For Determining Used-Car Market Values. In Proceedings of 9th International Symposium on Intelligent Manufacturing and Service Systems (IMSS'14), October, 2014.
- Demiriz, A., and Bagherzadeh, N.. On Heterogeneous Network-on-Chip Design Based on Constraint Programming. In Proceedings of 6th International Workshop on Network on Chip Architectures (NoCArc'13), December, 2013.
- Demiriz, A., Bagherzadeh, N., Alhoussein, A.. CPNoC: On Using Constraint Programming in Design of Network-on-Chip Architecture, pp.486–493, 21st Euromicro International Conference on Parallel, Distributed, and Network-Based Processing, 2013.

- Demiriz, A., Ekizoglu, B., Kula, U.. Clustering Products under Pairwise Positive and Negative Association Constraints in Retailing. In Proceedings of ANNIE 2010 in St. Louis, Mo., Nov. 1-3, 2010.
- Demiriz, A., Ertek, G., Atan, T., Kula, U.. Re-Mining Positive and Negative Association Mining Results. In Proceedings of 10th Industrial Conference on Data Mining ICDM'2010 Berlin, Germany. July, 2010. Pp. 101-114.
- Demiriz, A., Cihan, A. Kula, U.. Analyzing Price Data to Determine Positive and Negative Product Associations. In Proceedings of 16th International Conference on Neural Information Processing Bangkok, Thailand. December, 2009. Pp. 846-855.
- Demiriz, A.. Solving Traveling Salesman Problem by Ranking. In Proceedings of The 18th Annual Belgian-Dutch Conference on Machine Learning (Benelearn 09), Tilburg, The Netherlands. May 2009.
- Demiriz, A.. *Ranking Data with Graph Laplacian*. In Proceedings of International Conference on Multivariate Statistical Modelling & High Dimensional Data Mining. Kayseri, TURKEY. 2008.
- Ertek, G., Demiriz, A.. *A Framework for Visualizing Association Mining Results*. In the Proceedings of International Symposium on Computer and Information Sciences (Springer LNCS Series Vol. 4263), Istanbul, 2006.
- Demiriz, A.. *ASIPATH: A Simple Path Mining Algorithm*. In Proceedings of the 16th IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS 2004), pages 638-644 November 9-11, 2004 Cambridge, MA, USA.
- Demiriz, A. *webSPADE: A parallel sequence mining algorithm to analyze web log data*. In Proceedings of Second IEEE International Conference on Data Mining, pages 755-758. Maebashi City, Japan (2002).
- Bennett, K. P., Demiriz, A., Maclin, R.. *Exploiting Unlabeled Data in Ensemble Methods*. In Proceedings of the Eighth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, David Hand, Daniel Keim, and Raymond Ng, Editors, pp. 289-296, ACM Press, Edmonton, CANADA, July, 2002.
- Demiriz, A., Bennett, K. P., Breneman, C. M., Embrechts, M. J.. *Support Vector Machine Regression in Chemometrics*. In Computing Science and Statistics: Proceedings of Interface, volume 33, 2001.
- Bennett, K.P., Demiriz, A., Shawe-Taylor, J.. *A Column Generation Algorithm for Boosting*. In the Proceedings of Seventeenth International Conference on Machine Learning (ICML'2000), Pat Langley Editor, Morgan Kaufmann, San Francisco, 2000, pp. 65-72.
- Demiriz, A., Bennett, K.P., Embrechts, M.J.. *Semi-supervised Clustering using Genetic Algorithms*. In Smart Engineering System Design: Neural networks, fuzzy logic, evolutionary programming, data mining and complex systems: Proceedings of the Artificial Neural Networks in Engineering Conference (ANNIE '99), November, 1999, editors, C. H. Dagli [et al.]. New York, ASME Press, 1999.
- Bennett, K.P., Demiriz, A.. *Semi-supervised Support Vector Machines*. In Advances in Neural Information Processing Systems (NIPS), M. S. Kearns, S. A. Solla, and D. A. Cohn Eds. 11 Cambridge, 1999. MIT Press. Pages 368-374.

- **Book Chapters**

- Demiriz, A.. *A Data Mining-Based Framework for Multi-item Markdown Optimization*. In "Artificial Intelligence for Fashion Industry in the Big Data Era", Sébastien Thomassey and Xianyi Zeng. Pages 47-70. Springer, Singapore (2018).

- Ertek, G., Demiriz, A., and Cakmak, F. *Linking Behavioral Patterns to Personal Attributes through Data Re-Mining*. To be published in Behavior Computing: Modeling, Analysis, Mining and Decision, Eds. Longbing Cao, Philip S. Yu. LNCS, Springer. September, 2011.
- Demiriz, A., Bennett, K. P., Bradley, P. S.. *Using Assignment Constraints To Avoid Empty Clusters in K-Means Clustering*. In "Constrained Clustering: Advances in Algorithms, Theory, and Applications" (Chapman & Hall/CRC Data Mining and Knowledge Discovery Series) by Sugato Basu, Ian Davidson, Kiri Wagstaff (Editors). 2008.
- Demiriz, A.. *On Analyzing Web Log Data: A Parallel Sequence Mining Algorithm*. In "New Generation of Data Mining Applications", Jozef Zurada and Mehmed Kantardzic. Pages 469-494. Wiley-IEEE Press (February, 2005).
- Demiriz, A., Bennett, K.P.. *Optimization Approaches to Semi-supervised Learning*. In Complementarity: Applications, Algorithms and Extensions. M. C. Ferris, O. L. Mangasarian and J.-S. Pang, editors. Pages 121-141. Kluwer Academic Publishers. Boston 2001.

- **Work in Progress and Technical Reports**

- Demiriz, A.. DiscoVars: A New Data Analysis Perspective - Application in Variable Selection for Clustering. Verikar Software Technical Report. May, 2022.
- Demiriz, A. *Analyzing Service Order Data using Association Mining*. Technical Report. 2003.
- Bradley, P.S., Bennett, K.P., Demiriz, A.. *Constrained K-Means Clustering*. Microsoft Research Technical Report 2000-65, May 2000.

- **Presentations**

- Snowbird' 98, Spring'98, Snowbird, UT.
- Institute for Operations Research and the Management Sciences (INFORMS) Montreal. Spring'98, Montreal, CANADA.
- Institute for Operations Research and the Management Sciences (INFORMS) Seattle. Fall'98, Seattle, WA.
- Neural Information Processing Systems' 98 (NIPS' 98). Fall'98, Denver, CO.
- International Conference on Complementarity Problem'99 (ICCP'99). Summer'99, University of Wisconsin, Madison, WI
- AT&T Research Day. Fall'99, Florham Park, NJ.
- Snowbird' 99, Spring'99, Snowbird, UT.
- Artificial Neural Networks in Engineering' 99 (ANNIE' 99). University of Missouri - Rolla, St. Louis, MO.
- Institute for Operations Research and the Management Sciences (INFORMS) Philadelphia. Fall'99, Philadelphia, PA.
- Neural Information Processing Systems' 99 (NIPS' 99). Fall'99, Denver, CO.
- CRM/ MITACS/ IRIS Workshop on Selecting and Combining Models with Machine Learning Algorithms Montreal, Quebec, Canada. April, 2000.
- International Conference on Machine Learning' 2000. July 2000. Stanford, CA.
- Computing Science and Statistics: Interface'01. June, 2001. Orange County, CA.
- Institute for Operations Research and the Management Sciences (INFORMS) Miami Beach. Fall 2001. Miami, FL.

- Eighth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Edmonton, CANADA, July, 2002.
- The 2002 IEEE International Conference on Data Mining, Maebashi City, Japan. December, 2002.
- The 16th IASTED International Conference on Parallel And Distributed Computing And Systems (PDCS 2004) November 9-11, 2004 Cambridge, MA
- The Fifth International Symposium on Intelligent Manufacturing Systems, Sakarya, Turkey. 2006.

Skills

- **Computer Languages:**
 - Proficient in C++, C, SQL, COBOL
 - Familiar with Python, Java, C#
- **Tools and Systems:**
 - Proficient in SAS, SQL Server, MATLAB, IBM ILOG, Splus, AMPL, MOSEK, SPSS Clementine, Knowledge Studio, CART, C4.5
 - Familiar with SIMAN, Arena, ProModel, Lindo.

Membership Affiliation

- ACM
- SIAM
- Alpha Pi Mu Industrial Engineering Honor Society
- INFORMS
- American Association for Artificial Intelligence (AAAI)
- SIAM Mathematical Programming Society

Honors and Awards

- Ranked third in Eastern Region in a nationwide chemistry exam given by Turkish Scientific & Technological Research Council. 1989.
- Anadolu Group (Isuzu) Scholarship. 1991-1993.
- Higher Education Council Scholarship for Graduate Study Abroad. 1995.

Professional Activities

- Program Committee Member of The Third IEEE International Conference on Data Mining
- Program Committee Member of The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, 2010
- **Reviewed papers for various well-known journals including**
 - Journal of Data Mining and Knowledge Discovery
 - Journal of Machine Learning Research
 - Journal of Machine Learning
 - Pattern Recognition Letters
 - ACM Transactions on Knowledge Discovery from Data
 - IEEE Transactions on Knowledge and Data Engineering
 - IEEE Transactions on Signal Processing
 - Neural Computing