

DR. APARNA VARDE – CURRICULUM VITAE

Assistant Professor, Computer Science
Montclair State University, NJ

Email: vardea@mail.montclair.edu
<https://netdrive.montclair.edu/~vardea>

AREAS OF INTEREST

Data Mining, Artificial Intelligence, Database Management, Multidisciplinary Work

EDUCATION

- **Ph.D., Computer Science**, Worcester Polytechnic Institute (WPI), Worcester, MA, Oct 2006
 - *Dissertation*: Graphical Data Mining for Computational Estimation in Materials Science Applications
 - *Qualifier*: Solving Concurrency Conflicts in Incremental Maintenance of Data Warehouses
 - *Advisor*: Dr. Elke Rundensteiner, Full Professor, Department of Computer Science
- **M.S., Computer Science**, WPI, Worcester, MA, Feb 1999
- **B.E., Computer Engineering**, University of Bombay, India. May 1995, First Class with Distinction

WORK EXPERIENCE

- **Tenure Track Assistant Professor**, Department of Computer Science (CS), Montclair State University (MSU), Montclair, NJ, Fall 2008 till date; also Doctoral Faculty in Environmental Management Program since Fall 2009
 - Research Areas – Text Mining, Scientific Data Mining, Web Databases, Machine Learning
 - Head of the Center for Data Mining, a multidisciplinary research lab in CS at MSU; working on projects with: other CS faculty at MSU, the Department of Linguistics at MSU, the Department of Environmental Science at MSU, the Materials Science Program at WPI, the Department of Engineering and Technology at Virginia State University, and the Max Planck Institute, Germany
 - Teaching
 - Databases and the Internet
 - Machine Learning
 - Foundations of Computer Science I: Programming in Java
 - Foundations of Computer Science II: Advanced Programming in Java
 - Computer Applications and Fluency with Information Technology
 - Service – Academic Advising, Curriculum Development, ABET Service, Industry-University Collaboration, Comprehensive Examination Grading, Service for Ph.D. Program in Computational Science, Journal and Conference Reviews
 - Research Advising
 - Doctoral Dissertation Advisor for a Ph.D. student in Environmental Management
 - Student: Michael Pawlish, Area: Green Information Technology
 - Masters' Thesis Advisor for M.S. student in Computer Science
 - Student: Amal Kaluarachchi, Topic: Time Aware Query Translation in Text Archives
 - Masters' Project Advisor for 2 M.S. students in Computer Science
 - Student: Debjani Roy, Topic: Terminology Evolution in Web and Text Mining using Association Rules; Graduation Date: May 2009
 - Student: Muharrem Aker, Topic: Automated Rule Extraction over a Scientific Data Warehouse using a Domain-Specific Markup Language;
 - Summer Research Advisor for M.S. student in Computer Science
 - Student: Aliva Pradhan, Topic: - Classification of Errors in Non-native English Writer Texts
 - 1 external Ph.D. student in CS at Queensland University of Technology, Australia,
 - Student: Tien Tran, Topic: XML Clustering Algorithms and their Application to XML Transformation
 - 2 external B.S. students in CS from Iona College and Delaware State University respectively as a Senior Personnel on a grant from NSF REU
 - Students: Gregory Roughton and Lisa McKee, Topic: Feature-Based and Wavelet Based Approaches in Image Processing

- **Visiting Senior Researcher**, Max Planck Institute for Informatics, Saarbrucken, Germany, Summer 2008
 - Group – Databases and Information Systems
 - Project – Web and Text Mining
 - Collaboration – Ongoing through Graduate Student Work
- **Tenure Track Assistant Professor**, Department of Mathematics and Computer Science, Virginia State University, Petersburg, VA, Fall 2006 to Spring 2008
 - Research - Scientific Data Mining, Web Databases, Machine Learning
 - Teaching – Artificial Intelligence, Data Mining, Introduction to Computers, Algebra and Trigonometry
 - Service – Academic Advising, Curriculum Development, Industrial Relations, Assessment Committees
- **Research Consultant**, ASM International, WPI. Worcester, MA, January 2006 onwards
 - Project – MatML, XML for Materials Property Data: Schema and Ontology Development, Data Exchange
- **Instructor (Faculty)**, Department of Computer Science, WPI. Worcester, MA, Summer 2005
 - Graduate Course - Database Management Systems (DBMS)
- **Doctoral Research Assistant**, Center for Heat Treating Excellence (CHTE), Metal Processing Institute International Industry University Consortium, WPI. Worcester, MA, USA. May 2002 to December 2005
 - Project - Quenching: Understanding Controlling and Optimizing the Process
 - Proposed an estimation technique AutoDomainMine, a CHTE trademark
 - Developed an expert system QuenchMiner, also a CHTE trademark
- **Graduate Teaching Assistant**, WPI. Worcester, MA, Aug 2001 to Apr 2002 (Department of Physics), January 1998 to April 1998 (Department of Computer Science)
 - Computer Science Courses - Introduction to Programming, Data Structures and Programming Techniques
 - Physics Courses - Mechanics, Electricity and Magnetism
- **Computer Systems Engineer**, Lucent Technologies. North Andover, MA, January 1999 to June 2001
 - Project 1 - Web Based Data Extraction Software for the Maintenance and Calibration Control
 - Project 2 - Data Mart for the Circuit Pack Engineering Group
 - Project 3 - Embedded Systems Programming for the Bell Labs Optical Networking Group
 - Published a paper in Lucent WebTech-99 based on work in Projects 1 and 2 and Masters Research in WPI
- **Associate Consultant**, Citicorp Information Technology. Bombay, India. March 1996 to December 1996
 - Project - Development of a Retail Banking System FINWARE (released in banks worldwide)
- **Software Engineer**, Computer Maintenance Corporation. Bombay, India. June 1995 to February 1996
 - Project - Building and Maintaining a Mutual Funds Information Management System

HONORS

- **Senior Personnel on NSF REU Grant** on the iImagine Project, starting summer 2010 for 3 years, PI: S. Robila
- **Panelist for NSF (National Science Foundation)** in CDI (Cyber-enabled Discovery and Innovation Program), part of IIS (Division of Information and Intelligent Systems), 2008
- **Software Trademarks** for AutoDomainMine, a computational estimation tool based on graphical data mining and QuenchMiner, an expert system in the heat treatment of materials, 2006
- **Awarded Membership of Sigma Xi (Scientific Research Society)** for excellence in multidisciplinary research, April 2005
- **Funded by Grant from DOE (Department of Energy)** Award Number DE-FC-07-011D14197 supporting Ph.D. research (along with CHTE), May 2002 to December 2006, Principal Investigator: Prof. Richard Sisson Jr.

PROFESSIONAL ACTIVITIES

- **Journal Reviewer** for IEEE's TKDE (Transactions on Knowledge and Data Engineering), ACM's VLDB (Very Large Databases), Elsevier's DKE (Data and Knowledge Engineering), IEEE's Intelligent Systems, Elsevier's Information Systems journals
- **Invited Speaker** at the Ph.D. Colloquium in ER 2009 (Conceptual Modeling international conference)
- **Tutorial Presenter** at DASFAA 2009 (Database Systems for Advanced Applications international conference)
- **Program Committee Chair** of PIKM 2007 and PIKM 2008 (Ph.D. workshops in ACM CIKM conferences)

- **Program Committee Member** in ER 2009 (International Conference on Conceptual Modeling), EDBT 2009 (Extending Data Base Technology conference), IEEE's ICDM 2008 (International Conference on Data Mining), DEXA 2008 (Databases and Expert Systems Applications conference), SDM 2008 (SIAM Data Mining conference), ISDIKS 2007 (International Symposium on Data, Information and Knowledge Spectrum), WAIM 2008 (Web Age Information Management conference), ACM KDD's MDM 2007 (Multimedia Data Mining workshop)
- **Steering Committee Member of MatML**, the Materials Markup Language team for development of a standard along with NIST (National Institute of Standards and Technology), Oct 2004 onwards
- **Invited Speaker** in ICDCIT 2006 (International Conference on Distributed Computing and Internet Technology), Database Management Track
- **External Reviewer** for VLDB 2005 (Very Large Data Bases), ICDE 2004 (International Conference on Data Engineering), SIGMOD 2003 (Special Interest Group on Management of Data)
- **Collaborative Grants** from NSF (National Science Foundation), NIH (National Institute of Health) and DOE (Department of Energy)
- **Graduate Student Representative** in Computer Science Faculty Meetings, WPI, Aug 2004 – May 2005
- **President of CS-GSO**, the Computer Science Graduate Student Organization, WPI Aug 2001 - Aug 2002
- **Executive Committee Member in 4A-Lucent**, the Asian American Association for Advancement, Lucent Technologies, North Andover, MA, Jun 2000 - May 2001
- **Vice President of ISO**, the Indian Students Organization, Jan 1998 - Dec 1998
- **Gold Medalist as Outstanding Student in Engineering College** in Bombay, India, May 1995
- **Treasurer of IEEE Student Chapter in Engineering College** in Bombay, India, Aug 1993 - May 1995. Chapter won IEEE Region 10 Award for Excellence in Membership Activities
- **Active Member of Technical Organizations** such as IEEE, ACM, AAAI, ASM International

BOOK CHAPTER

- *XML Based Markup Languages for Specific Domains*, A. Varde, E. Rundensteiner and S. Fahrenholz, Peer-reviewed chapter to appear in the Book: **Web Based Support Systems**, Publisher: Springer, Editor: Jingtao Yao, Year: 2010

JOURNAL ARTICLES

- *Challenging Research Issues in Data Mining, Databases and Information Retrieval*, A. Varde, In the Journal of ACM's Special Interest Group on Knowledge Discovery and Data Mining Explorations (**SIGKDD Explorations**), ACM, 2009, 11(1): 49-52
- *Comparing Mathematical and Heuristic Approaches for Scientific Data Analysis*, A. Varde, S. Ma, M. Maniruzzaman, D. Brown, E. Rundensteiner and R. Sisson Jr., In the Journal of Artificial Intelligence for Engineering Design, Analysis and Manufacturing (**AIEDAM**), Cambridge University Press, 2008, 22:53 – 69
- *Advances in Information and Knowledge Management*, A. Varde and J. Pei, In the Journal of ACM's Special Interest Group on Information Retrieval Forum (**SIGIR Forum**), ACM, 2008, 42(1): 29-35
- *LearnMet: Learning Domain-Specific Distance Metrics for Plots of Scientific Functions*, A. Varde, E. Rundensteiner, C. Ruiz, M. Maniruzzaman and R. Sisson Jr., In the International Journal of Multimedia Tools and Applications (**MTAP**), Springer Publishers, 2007. Special Issue on Multimedia Data Mining, 35:29 – 53
- *Data Mining in Heat Treating: From QuenchMiner to AutoDomainMine*, R. Sisson Jr. and A. Varde, In **Heat Treating Progress**, March /April 2006, pp 18 – 20
- *Apriori Algorithm and Game-of-Life for Predictive Analysis in Materials Science*, A. Varde, M. Takahashi, E. Rundensteiner, M. Ward, M. Maniruzzaman and R. Sisson Jr., In the International Journal of Knowledge-Based and Intelligent Engineering Systems (**KES**), IOS Press, 2004, 8(4):213 – 228
- *Data Mining: Existing and Proposed Applications and Powerful Tools for Heat Treatment*, A. Varde and R. Sisson Jr., In **Heat Treating Progress**, January / February 2004, pp. 48 – 49

CONFERENCE PRESENTATIONS AND PAPERS

- *Intelligent Time Aware Query Translation for Text Sources*, A. Kaluarachchi, A. Varde, J. Peng and A. Feldman, To appear as a poster paper in the international conference of the American Association for Artificial Intelligence (**AAAI-2010**), Atlanta, Georgia, July 2010
- *Automatic Classification of Article Errors in L2 Written English*, A. Pradhan, A. Varde, J. Peng and E. Fitzpatrick, To appear in the AAAI-sponsored international conference of the Florida Artificial Intelligence Research Society, Special Track on Natural Language Processing (**FLAIRS-2010**), May 2010
- *A Feature-Based Approach for Processing Nanoscale Images*, G. Roughton, A. Varde, S. Robila and J. Liang, To appear in the SPIE Scanning Microscopy international conference (**SPIE-2010**), Monterey, California, May 2010
- *Knowledge Discovery over the Deep Web, Semantic Web and XML*, A. Varde, F. Suchanek, R. Nayak and P. Senellart, In Springer's international conference on Database Systems for Advanced Applications, (**DASFAA 2009**), Brisbane, Australia, April 2009, pp. 784-788
- *Proceedings of the Second Ph.D. Workshop in CIKM, PIKM 2008*, P. Roy and A. Varde, In ACM Conference on Information and Knowledge Management, (**CIKM 2008 Workshops**), Napa Valley, California, USA, October 30, 2008 ACM 2008
- *Component Selection to Optimize Distance Function Learning in Complex Scientific Data Sets*, A. Varde, S. Bique, E. Rundensteiner, D. Brown, J. Liang, R. Sisson Jr., E. Sheybani and B. Sayre, In Springer's Database and Expert System Applications (**DEXA 2008**), Turin, Italy, September 2008, pp. 269 - 282
- *Proceedings of the First Ph.D. Workshop in CIKM, PIKM 2007*, A. Varde and J. Pei, In ACM Conference on Information and Knowledge Management, (**CIKM 2008 Workshops**), Lisbon, Portugal, November 9, 2007
- *AutoDomainMine: A Graphical Data Mining System for Process Optimization*, A. Varde, E. Rundensteiner and R. Sisson Jr., In Association of Computing Machinery's 27th International Conference of the Special Interest Group on Management of Data (**ACM SIGMOD-07**), Beijing China, June 2007, pp. 1103 -1105
- *Learning the Relative Importance of Features in Image Data*, A. Varde, E. Rundensteiner, G. Javidi, E. Sheybani and J. Liang, In IEEE International Conference on Data Engineering Workshop on Ranking in Databases (**IEEE ICDE DBRank-07**), Istanbul, Turkey, April 2007, pp. 237-244
- *Mining Images of Material Nanostructure Data*, A. Varde, J. Liang, E. Rundensteiner and R. Sisson Jr., Invited paper in the 3rd International Conference on Distributed Computing and Internet Technology (**ICDCIT-06**), Bhubaneswar, India, December 2006, pp. 403 – 413
- *Designing Semantics-Preserving Cluster Representatives for Scientific Input Conditions*, A. Varde, E. Rundensteiner, C. Ruiz, D. Brown, M. Maniruzzaman and R. Sisson Jr., In ACM's 15th Conference on Information and Knowledge Management (**ACM CIKM-06**), Arlington, VA, Nov 2006, pp. 708 – 717
- *MatML: XML for Information Exchange with Materials Property Data*, A. S. Varde, E. F. Begley, S. Fahrenholz-Mann, In ACM 12th International Conference on Knowledge Discovery and Data Mining, Workshop on Data Mining Standards, Services and Platforms (**ACM KDD DM-SPP-06**), Philadelphia, PA, Aug 2006, pp. 47-54
- *Integrating Clustering and Classification for Estimating Process Variables in Materials Science*, A. Varde, E. Rundensteiner, C. Ruiz, D. Brown, M. Maniruzzaman and R. Sisson Jr., In Association for Advancement of Artificial Intelligence 21st National Conference on Artificial Intelligence, (**AAAI-06**), Boston, MA, Jul 2006
- *Effectiveness of Domain-Specific Cluster Representatives for Graphical Plots*, A. Varde, E. Rundensteiner, C. Ruiz, D. Brown, M. Maniruzzaman and R. Sisson Jr., In ACM International Conference of the Special Interest Group on Management of Data, 3rd Workshop on Information Quality in Information Systems (**ACM SIGMOD IQIS-06**), Chicago, IL, Jun 2006, pp. 24-29
- *Learning Semantics-Preserving Distance Metrics for Clustering Graphical Data*, A. Varde, E. Rundensteiner, C. Ruiz, M. Maniruzzaman and R. Sisson Jr., In ACM 11th KDD, 6th Workshop on Multimedia Data Mining (**ACM KDD MDM-05**). Chicago, IL, Aug 2005, pp. 107-112
- *Data Mining over Graphical Results of Experiments with Domain Semantics*, A. Varde, E. Rundensteiner, C. Ruiz, M. Maniruzzaman and R. Sisson Jr., In ACM's 2nd International Conference on Intelligent Computing and Information Systems with Special Interest Group on Artificial Intelligence (**ACM SIGART ICICIS-05**), Cairo, Egypt, Mar 2005, pp. 603 – 611
- *Semantic Extensions to Domain-Specific Markup Languages*, A. Varde, E. Rundensteiner, M. Mani, M. Maniruzzaman and R. Sisson Jr., In International Conference on Computing, Communications and Control Technologies by the University of Texas at Austin and the Institute of Electrical and Electronics Engineers (**IEEE CCCT-04**). Austin, TX, Aug 2004, Vol. 2, pp. 55 – 60

- *QuenchMiner: Decision Support for Optimization of Heat Treating Processes*, A. Varde, M. Takahashi, E. Rundensteiner, M. Ward, M. Maniruzzaman and R. Sisson Jr., In IEEE's 1st Indian International Conference on Artificial Intelligence (**IEEE IICAI-03**). Hyderabad, India, Dec 2003, pp. 993 – 1003
- *MEDWRAP: Consistent View Maintenance over Distributed Multi-Relation Sources*, A. Varde and E. Rundensteiner. In 13th International Conference on Databases and Expert System Applications (**DEXA-02**). Springer Publishers, Aix-en-Provence, France, Sep 2002, pp. 341 – 350
- *SWECCA for Data Warehouse Maintenance*, A. Varde and E. Rundensteiner, In 6th Multi-conference on Systemics, Cybernetics and Informatics (**SCI-02**). Orlando, FL, Jul 2002, Vol. 5, pp. 352 – 357
- *Data Warehousing and Data Extraction on the World Wide Web*, A. Varde. In Lucent Technologies' International Forum on Web Technology (**WebTech-99**). Somerset, NJ, Nov 1999

APPLICATION DOMAIN PROCEEDINGS

- *Estimating Heat Transfer Coefficients as a Function of Temperature by Data Mining*, A. Varde, E. Rundensteiner, M. Maniruzzaman and R. Sisson Jr., In American Society of Materials 23rd International Heat Treating Society Conference (**ASM HTS-05**). Pittsburgh, PA, Sep 2005
- *The QuenchMiner Expert System for Quenching and Distortion Control*, A. Varde, E. Rundensteiner, M. Maniruzzaman and R. Sisson Jr., In ASM 22nd International Heat Treating Society Conference (**ASM HTS-03**). Indianapolis, IN, Sep 2003
- *Quenching: Understanding, Controlling and Optimizing the Process*, S. Ma, A. Varde, M. Takahashi, D. Rondeau, M. Maniruzzaman and R. Sisson Jr., In International Conference on Quenching and Control of Distortion (**ICQCD-03**), Beijing, China, May 2003
- *Estimation of Surface Heat Transfer Coefficients for Quenching Process Simulation*, M. Maniruzzaman, A. Varde and R. Sisson Jr., In TMS's Materials Science and Technology (**TMS MS&T-06**), Symposium on The Role of Computational Methods in Materials Research and Development, Cincinnati, OH, Oct 2006
- *Augmenting MatML with Heat Treating Semantics*, A. Varde, E. Rundensteiner, M. Mani, M. Maniruzzaman and R. Sisson Jr., In ASM's Materials Solutions Conference (**ASM MatSol-04**), Symposium on Developments in Web-Based Material Property Databases, Columbus, OH, Oct 2004
- *Computational Estimation of Heat Transfer Curves for Microstructure Prediction and Decision Support*, A. Varde, E. Rundensteiner, M. Maniruzzaman and Richard Sisson Jr., In TMS's Materials Science and Technology (**TMS MS&T-04**), Computational Microstructure Evolution Symposium, New Orleans, LA, Sep 2004
- *Web Based Data Mining for Quenching Analysis*, A. Varde, M. Takahashi, M. Maniruzzaman and R. Sisson Jr., In International Federation of Heat Treating and Surface Engineering / International Surface Engineering Congress (**IFHTSE/ISEC**), Columbus, OH, Oct 2002

COMPUTER SKILLS

- **Programming Languages:** Java, C, C++, LISP, Pascal, COBOL, BASIC, FORTRAN
- **Data Mining and Statistical Tools:** WEKA, XLMiner, MATLAB, SAS
- **Database Packages:** MySQL, Oracle, Sybase, FoxPro
- **Expert System Tools:** JESS, CLIPS
- **Web Development Languages:** XML, XPath, XQuery, RDF, OWL, HTML, JSP, Javascript, PHP
- **Embedded Systems:** DIAB C and C++ Compilers, Motorola 68000 Processor Family
- **Assembly Languages:** 8085, 8086 Mnemonics