

JANET M. TWOMEY, Ph.D.
Professor
Industrial and Manufacturing Engineering
Wichita State University

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RESEARCH INTERESTS

Intelligent Computational Methods, Technology for Environmental Sustainability

EDUCATION

Ph.D., Industrial Engineering, University of Pittsburgh, April 1995
M.S. Industrial Engineering, University of Pittsburgh, April 1992
B.S. Industrial Engineering, University of Pittsburgh, April 1990, cum laude graduate, Alpha-Pi-Mu
Industrial Engineering National Honor Society
B.A. Psychology /Sociology, Duquesne University, Pittsburgh, PA, May 1977

ACADEMIC EMPLOYMENT

Associate Professor, Department of Industrial and Manufacturing Engineering, Wichita State University, August 2000–present.

Program Officer, Manufacturing Enterprise Systems, Division of Design, Manufacture and Industrial Innovation, Engineering Directorate, National Science Foundation, August 2001–August 2004.

Assistant Professor, Department of Industrial and Manufacturing Engineering, Wichita State University, August 1994–2000.

Research Specialist: Data Analyst/Manager, Western Psychiatric Institute and Clinic, School of Medicine, University of Pittsburgh, 1990–1994.

Project Coordinator, Western Psychiatric Institute and Clinic, School of Medicine, University of Pittsburgh, 1981–84.

Research Associate Senior, Western Psychiatric Institute and Clinic, School of Medicine, University of Pittsburgh, 1978–81.

AWARDS AND HONORS

Boeing Faculty Fellow, 2007

Duane and Thelma Wallace Outstanding Educator Award for Research Excellence, 2001

A.D. Welliver Boeing Faculty Summer Fellow, 1999

National Science Foundation (NSF) CAREER Award, 1998

Faculty Associate, National Institute for Aviation Research, 1997–99

Nominated for the Board of Trustees Excellence in Teaching (BOT) for academic years 1997, 1999, 2000

MONOGRAPHS AND CHAPTERS IN BOOKS

Forward, *Recent Advances in Data Mining of Enterprise Data*, in press, T.W. Liao and E. Triantaphyllou, eds.

“There’s No Formula, But Read This Anyway,” 2007, *NSF CAREER Proposal Writing Tips*, Z.J. Pei, ed., ISBN 978-1-4303-0697-9.

“Validation and Verification,” 1997, in *Artificial Neural Networks for Civil Engineers: Fundamentals and Applications*, N. Kartam, I. Flood, and J. Garrett, eds.

JOURNAL ARTICLES

Mehmet Bayram Yildirim, Janet Twomey, Jamal Ahmad,* Lawrence Whitman, and Haitao Liao, under review, Energy Profiles of Manufacturing Equipment for Reducing Consumption in a Production Setting, *Journal of Manufacturing Science*.

Ahmad, J., Twomey, J.M., Kalla,* D., and Lodhia,* P., in press, “Multiple regression and committee neural network force predication models in milling FRP,” *Journal of Machining Science*.

Ahmad, J., and Twomey, J.M., 2007, “ANN constitutive model for high strain-rate deformation of Al 7075,” *Journal of Materials Processing Technology*, 186, pp. 339-345.

Mouzon,* G., Yildirim, Mehmet B., and Twomey, J. M., 2007, “Operational methods for minimization of energy consumption of manufacturing equipment,” *International Journal for Production Research*, 45, pp. 4247–4271.

Chetchotsak,* D., and Twomey, J.M., 2006, “Improving committee networks’ performance under sparse data conditions: The biased regression and bootstrap error estimation approaches,” *International Journal of General Systems*, 1, pp. 1–21.

Sen,* S., Ahmad, J., and Twomey, J.M., 2005, “ANN constitutive model for high strain-rate deformation of Al 7075-T6,” *Transactions of NAMRI/SME*, 33, pp. 565–572 (nominated for best paper award).

Cheraghi, S.H., Chen,* X., Twomey, J.M., and Arupthi,* R., 1999, “A closed-loop process analysis and control system for machining parts,” *International Journal of Production Research*, 37, pp. 1353–1368.

Ramani,* B., Cheraghi, H., and Twomey, J.M., 1998, “CAD-based integrated tolerance system,” *International Journal of Production Research*, 36, pp. 2891–2910.

Twomey, J.M., and Smith, A. E., 1998, "Bias and variance of validation methods for function approximation neural networks under conditions of sparse data." *IEEE Transactions on Systems, Man, and Cybernetics*, 28, pp. 417–430.

Eksioglu,* M., Fernandez, J.E., and Twomey, J.M., 1996, "Predicting peak pinch strength: Artificial neural network vs. regression," *International Journal of Industrial Ergonomics*, 8, pp. 431–441.

Islam,* A., Twomey, J.M., and Motavalli, S., 1996, "Optimal interval for condition monitoring of production machines," *Journal of Engineering Design and Automation*, 1, pp. 239–247.

Twomey, J.M., Smith, A.E., and Redfern, M.S., 1995, "A predictive model for slip resistance using artificial neural networks." *IIE Transactions*, 27, pp. 374–381.

Twomey, J.M., and Smith, A.E., 1995, "Performance measures, consistency, and power for artificial neural network models," *Journal of Mathematical and Computer Modeling*, 21, pp. 243–258.

REFEREED CONFERENCE PROCEEDINGS

Drake,* R., Yildirim, M., Twomey, J.M., Whitman, L., Ahmad, J., and Lodhia,* P., 2006, "Data collection framework on energy consumption in manufacturing," Institute of Industrial Engineering Research Conference, Orlando, FL, May 21–24, CD-Rom.

Whitman, L., Twomey, J., and Patil,* A., 2006, "Greening the value stream: Towards an environmental index," *Proceedings of the 9th IFAC Symposium on Automated Systems Based on Human Skill and Knowledge*, Nancy, France, May 22-24, CD-Rom.

Kalla,* D., Lodhia,* P., Bajracharya,* B., Twomey, J.M., and Ahmad, J., 2005, "CN force predication model in milling of carbon fiber reinforced polymers," SPIE Optics East, Boston MA, October 24–26, CD-Rom.

Chetchotsak,* D., and Twomey, J.M., 2004, "Performance sensitivity analysis of the r-k class estimator committee (RKC)," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 14, pp. 321–327.

Whitman, L., Madhavan, V., Malzahn, D., Twomey, J.M., and Krishnan, K., 2002, "Virtual reality megacase throughout the curriculum," *Proceedings of the 2002 Frontiers in Education Conference*, Boston, MA., November, 6–9, CD-Rom.

Whitman, L., Madhavan, V., Malzahn, D., and Twomey, J.M., 2002, "Teaching process design using virtual reality," *Proceedings of the American Society of Engineering Education*, June 17–18, Chicago, IL, CD-Rom.

Whitman, L., Madhavan, V., Malzahn, D., Twomey, J.M., and Krishnan, K., 2002, "Using virtual reality to address competency gaps," *Proceedings of the American Society of Engineering Education*, Chicago, IL., June 17–18, CD-Rom.

Whitman, L., Madhavan, V., Malzahn, D., and Twomey, J.M., 2002, "Virtual reality model to aid case learning," *Proceedings of the Industrial Engineering Research Conference*, Orlando, FL., May, 19–21, CD-Rom.

Sen,* S., Twomey, J.M., and Ahmad, J., 2002, "Development of an artificial neural network constitutive model for aluminum 7075 alloy," *Industrial Engineering Research Conference*, Orlando, FL., May 19, 2002, CD-Rom.

Sen, * S., and Twomey, J.M., 2002, "Parameter estimation using connectionist constitutive model for aluminum 7075 alloy," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 12, pp. 653–659.

Chetchotsak, * D., and Twomey, J.M., 2002, "Improving generalization when data is scarce," *Intelligent Engineering Systems through Artificial Neural Networks*, ASME Press, 12, pp. 377–381.

Maradana, * S., and Twomey, J.M., 2001, "0.632e stop training method for neural networks under the conditions of sparse data," Industrial Engineering Research Conference, Dallas, TX, May 20-22, CD-Rom.

Chetchotsak, * D., Twomey, J.M., Steck, J., Skinner, S. and Bernstorf, E., 2001, "Playing a music synthesizer with EMG control: A musical instrument for severely disabled individuals," Industrial Engineering Research Conference, Dallas, TX, May 20-22, CD-Rom.

Chen, D., Krishnamurthy, K., Langari, R., Martinelli, L., Nejhad, M., Radcliffe, D., Riley, L, Taghavi, R., Takach, M., Twomey, J.M., and Zhao, Y., 2000, "Visioning transition: A framework for collaborative change," ASEE Annual Conference and Exposition: Engineering Education Beyond the Millennium, St. Louis, MO, June 18–22.

Siriphala, * P., and Twomey, J.M., 2000, "Controlling artificial neural networks overtraining when data is scarce," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 10, pp. 100–105.

Liu, * Y., Twomey, J., and Cheraghi, S. 1999, "Artificial neural network classification of drill bit quality," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 9, pp. 299–305.

Maradana, * S., and Twomey, J.M., 1999, "Data selection and analysis to identify the quality of drill bits using neural networks," 4th Annual International Conference on Industrial Engineering Application and Practice, San Antonio, TX, Nov., CD-Rom.

Ali, * A., Twomey, J.M., Maradana, * S., Cheraghi, H., and Liu, M. C., 1999, "Identification of important drill bit characteristics in the prediction of drilling forces using neural networks," Industrial Engineering Research Conference, San Antonio, TX, Nov., CD-Rom.

Sutherland, * J., Twomey, J.M., and Cheraghi, S., 1999, "More brains are better than one: An approach to identifying good and bad drill bits," 4th Annual International Conference on Industrial Engineering Application and Practice, San Antonio, TX, Nov., CD-Rom.

Cheraghi, S., Twomey, J.M., Krishnan, K., and Bahr, B., 1999, "An automated system for drill bit quality determination," SAE General, Corporate and Regional Aviation Meeting and Exposition (GCRAM), April, Wichita, Kansas, CD-Rom.

Twomey, J. M., and Littell, * M., 1998, "Development of large knowledge-based systems for a manufacturing setting," Technical papers of the North American Manufacturing Research Institution of SME, May 19-22, pp. 95–100.

Ali, * A., and Twomey, J.M., 1997, "Two industrial ergonomic applications of neural networks," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 7, pp. 1019–1024.

Kattel, * B., Twomey, J.M., and Fernandez, J., 1996, "Prediction of maximum grip strength from anthropometric measurements and physical characteristics of an individual: An artificial network approach," The First International Conference on Industrial Engineering Applications and Practice, Dallas, TX, Nov. pp. 900–905.

Sivasubramanian,* K., and Twomey, J.M., 1996, "A neural network approach to model over potential in electrochemical machining applications." *The First International Conference on Industrial Engineering Applications and Practice*, Dallas, TX, Nov. pp. 906–911.

Gottipati,* V., and Twomey, J.M., 1996, "Neural network approximation model of as/rs simulation." *The First International Conference on Industrial Engineering Applications and Practice*, Dallas, TX, Nov., pp. 912–917.

Twomey, J.M., and Smith, A. 1996, "Artificial neural network approach to the control of a wave soldering process," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 6, pp. 889–894.

Al-Rashid,* Y., and Twomey, J.M., 1996, "Neural networks application to short term power load forecasting," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 6, pp. 787–792.

Twomey, J.M., and Smith, A., 1995, "Committee networks by resampling," *Intelligent Neural Engineering Systems Through Artificial Networks*, ASME Press, 5, pp. 153–158.

Kilmer, R., and Twomey, J.M., 1995, "Applying artificial neural networks to combat simulation," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 5, pp. 1013–1018.

Eksioglu,* M., Fernandez, J., and Twomey, J.M., 1995, "An artificial neural network (ANN) prediction model for determining peak pinch strength," *Advances in Industrial Ergonomics and Safety VII*, Ed. A. Bittner, Taylor and Francis, pp. 101–106.

Twomey, J.M., and Smith, A. 1994, "Nonparametric error estimation methods for the evaluation and validation artificial neural networks," *Intelligent Engineering Systems Through Artificial Neural Networks*, ASME Press, 4, pp. 100-105.

Huston, T., Smith, A., and Twomey, J.M., 1994, "Neural networks as an aid to medical decision making: Comparing a statistical resampling technique with the train-and-test method for validation of sparse data sets," *Artificial Intelligence in Medicine: Interpreting Clinical Data*, AAAI Press Technical Report SS-94-01, pp. 70–73.

Twomey, J.M., and Smith, A., 1993, "Power curves for pattern classification networks," *Proceedings of the 1993 IEEE International Conference on Neural Networks*, San Francisco, CA, March, pp. 950–955.

Twomey, J.M., Smith, A., and Redfern, M. 1993, "A neural network model of the dynamic coefficient of friction," *Proceedings of the Second Industrial Engineering Research Conference*, Los Angeles, CA, May 10-13, , pp. 187–191.

Twomey, J.M., and Smith, A., 1992, "An examination of performance measures for pattern classification backpropagation neural networks," *Intelligent Engineering Systems through Artificial Neural Networks*, ASME Press, 2, pp. 343–348.

POSTER SESSION WITH CONFERENCE PROCEEDINGS

Yildirim, B., Twomey, J.M., Whitman, I., Liao, H., and Ahmad, J., 2006, A framework to reduce energy consumption of manufacturing equipment, energy 2030, International Conference on Energy Resources and Technologies, Petroleum Institute, Abu Dhabi, UAE.

Twomey, J.M., Whitman, L., Yildirim, Y., and Ahmed, J., 2006, "Research study: Inter-relationship of operational decisions and environmental impacts," *Proceedings of 2000 NSF Design and Manufacturing Grantees Conference*, St. Louis, MO, July, CD-Rom.

Twomey, J.M., 2000, "Neural network strategy for manufacturing processes when data is sparse," *Proceedings of 2000 NSF Design and Manufacturing Grantees Conference*, Vancouver, British Columbia, Canada, Jan., CD-Rom.

Twomey, J.M., 1999, "Neural network strategy for manufacturing processes when data is sparse," *Proceedings of 1999 NSF Design and Manufacturing Grantees Conference*, Long Beach, CA, Jan., CD-Rom.

Twomey, J.M., 1998, "Analysis of large complex industrial systems through distributed simulation models," *Proceedings of 1998 NSF Design and Manufacturing Grantees Conference*, Monterey, Mexico, Jan., CD-Rom.

Twomey, J.M., (1997), "Analysis and maximization of large complex industrial systems through distributed simulation," *Proceedings of 1997 NSF Design and Manufacturing Grantees Conference*, Seattle, WA, Jan. pp. 135-136.

Twomey, J. 1996, "Analysis and maximization of large complex industrial systems through distributed simulation," *Proceedings of 1996 NSF Design and Manufacturing Grantees Conference*, Albuquerque, NM, Jan., CD-Rom.

Twomey, J. 1995, "Analysis and maximization of large complex industrial systems through distributed simulation," *Proceedings of 1995 NSF Design and Manufacturing Grantees Conference*, San Diego, CA, Jan., CD-Rom.

JOURNAL ARTICLES IN PREPARATION

Twomey, J.M., Yildirim, M.B., Whitman, L., Liao, H., and Ahmad, J., "Energy profiles of manufacturing equipment for reducing consumption in a production setting," intended for the *Journal of Manufacturing Science and Engineering*.

Twomey, J.M., "Network strategy for response surfaces when data is sparse and noisy," intended for the *Journal of Intelligent Manufacturing*.

Maradana, S., Twomey, J.M., and Ahmad, J. "Toward an automatic method of network construction and validation using the .632e error estimator," intended for the *Journal of IEEE Knowledge and Data Engineering*.

Madhavan,* V., and Twomey, J.M., "Stacked committee networks for the prediction of spring back."

Emami,* T., and Twomey, J.M., "Committee network forecast of wind energy."

Li,* Z., and Twomey, J., "Data mining wind speed for power forecast"

PATENTS

"Computer Aided Assembly Tolerance Analysis Software," Commercialization Agreement with Systems Technology, Bloomfield Hills, Michigan, 1998, patent pending.

TECHNICAL REPORTS

Kumar, V., Zhao, H., Nayak (OSU), Iqbal, Q., Mouzon, G., Kolarik, W., Frazier, S., Twomey, J.M., Liao, H., and Yildirim, B., 2007, "Industrial assessment survey report: Aerospace metal processing and plating," United States Department of Energy.

Twomey, J.M., 2007, Year end report of "Sustainable Manufacturing: IV Global Conference on Sustainable Product Development and Life Cycle Engineering, San Carlos, Brazil, October 3–6, 2006," NSF, June.

Twomey, J.M., 2007, Year end report of "Research Study: Inter-Relationship of Operational Decisions and Environmental Impacts" NSF, June.

Twomey, J.M., 2005, Final report of "Neural Network Strategy for Machining when Data is Sparse," NSF-CAREER Award, August.

Twomey, J.M., 2003, Year-end report of "Neural Network Strategy for Machining when Data is Sparse," NSF-CAREER Award, August, 1999, 2000, 2001, 2002, 2003, 2004.

Twomey, J.M., and Cheraghi, S.H., 1999, Quarterly reports on "Automated Drill Bit Quality Determination," Manufacturing Innovation and Development Initiative in Aviation, National Institute for Aviation Research, June.

Twomey, J.M., and Cheraghi, S.H., 1998, Quarterly reports on "Automated System for Drill Bit Quality Determination," Manufacturing Innovation and Development Initiative in Aviation, National Institute for Aviation Research, joint with Boeing Aircraft Company, July, October, and December.

Twomey, J.M., 1997, "Cost analysis," the Cerebral Palsy Research Foundation, Wichita, KS, 1997.

Twomey, J.M., 1997, "Knowledge acquisition for aerospace manufacturing," Manufacturing Research and Development, Boeing Aircraft Company, Wichita, KS, September.

Twomey, J.M., 1996, Final report of "Analysis and Maximization of Large Complex Industrial Systems through Distributed Simulation," NSF Planning Grant, October.

Twomey, J.M., 1996, Final report of "Optimal Training and Validation Strategy for Neural Networks When Problems are Ill-Posed," First Award NSF-EPSCoR, December.

RESEARCH GRANTS

"Sustainable Energy Solutions from and for the Aerospace Industry," DOE, Twomey, PI, 6/2008-5/2009, \$1.0 million.

"5th Global Conference on Sustainable Product Development and Life Cycle Engineering, September 18– 21, 2007," Rochester Institute of Technology, Rochester, NY, NSF, Nasar, PI (RIT), 8/2007-7-2007???, \$49,000.

"Workshop: NSF Proposal Writing Workshop, August 20–21, 2007," NSF, Pei, PI, June 2007–May 2008, \$48,535.

"Sustainable Engineered Systems Lab: Equipment Proposal I," Twomey, PI, College of Engineering, April 2007, \$47,595.

"Sustainable Engineered Systems Lab: Equipment Proposal II," Twomey, PI, College of Engineering, April 2007, \$58,681).

"Wichita State University Power Quality Lab," Jewell, PI, April 2007, \$40,000).

NSF Planning Grant: "Wichita State University (WSU) Industry University Cooperative Research Center for the Reduction of Waste in Aerospace Logistic Systems," NSF, Twomey, PI, October–September 2006, \$10,000.

"WSU/University of Arkansas/ Oklahoma State University Industrial Assessment Center," Department of Energy, Yildirim (PI), Kolarik (OSU), PI, August 2006–July 2009, \$125,000/yr (\$9,500/yr for WSU).

"Lean and Green Production Systems Class Project," NSF, Whitman, PI, May 2007–April 2010, \$139,166.

"Research Study: Inter-Relationship of Operational Decisions and Environmental Impacts." NSF-DMI, J. Twomey, PI, August 2005–July 2007, \$100,000.

"Logistics, Distribution, and Infrastructure Planning for Kansas Biofuels and Biomass Industries 2020," NSF-EPSCoR, November 2006–December 2008, \$36,000.

"Sustainable Manufacturing: IV Global Conference on Sustainable Product Development and Life Cycle Engineering, San Carlos, Brazil, October 3–6," NSF, October 2006–August 2007, \$32,000.

"NSF Research Experience for Undergraduates," Supplement to Inter-Relationship of Operational Decisions and Environmental Impacts, August 2005–September 2008, \$10,000.

"Inter-Relationship of Operational Decisions and Environmental Impacts," NSF, August 2005 – August 2008, \$100,000.

"NSF Research Experience for Undergraduates," Supplement to NSF-CAREER Award, January–December 2004, \$10,000.

"Innovation in Aircraft Manufacturing through System-wide Virtual Reality Models and Curriculum Integration," NSF-PFI, Madhavan, PI, November 2002–October 2004, \$597,810.

"NSF Research Experience for Undergraduates," Supplement to NSF-CAREER Award, January – December 2001, \$10,000).

"NSF Research Experience for Undergraduates," Supplement to NSF-CAREER Award, January–December 2000, \$10,000.

"Design for Manufacturing," ADMARC, Krishnan, PI, May 2000–March 2003, \$147,400.

"Automated Drill Bit Quality Determination," Manufacturing Innovation and Development Initiative in Aviation, National Institute for Aviation Research, joint with Boeing and Cessna Aircraft Companies, Cheraghi, PI, April 2000–March 2001, \$280,000.

"An Investigation of the Effect of Heat Affected Zone on the Fatigue Properties of Laser-Cut Aerospace Alloys," Manufacturing Innovation and Development Initiative in Aviation, National Institute for Aviation Research, Talia, PI, May 1999–April 2000, \$54,960.

"NSF Research Experience for Undergraduates," Supplement to NSF-CAREER Award, January–December 1999, \$10,000.

"Playing a Musical Synthesizer with EEG Control: A Musical Instrument for Severely Disabled Individuals," U.S. Department of Education, National Institute on Disability and Rehabilitation Research, Steck, PI, January 1999–January 2000, \$42,779.

"Increased Production Rate Via High Speed Drilling," Manufacturing Innovation and Development Initiative in Aviation, National Institute for Aviation Research, Joint with Boeing and Cessna Aircraft Companies, Bahr, PI, May 1997–December 1998, \$69,181.

"Neural Network Strategy for Machining when Data is Sparse," NSF-CAREER Award, August 1998–August 2001, \$210,000.

"Industrial Match," NSF Supplement to CAREER Award, August 2008, \$25,000.

"Wichita State University Equipment Match to NSF CAREER Award," August 1998, \$10,000.

"Engineering Research/Educational Laboratory for the Study of Advanced Materials Processes and High Performance Aeronautical Materials," NSF-EPSCoR, Chaudhuri, PI, September 1997–September 1998, \$39,961.

"Optimal Training and Validation Strategy for Neural Networks When Problems Are Ill-Posed," Renewal of First Award NSF-EPSCoR, September–December 1996, \$6,000.

"Optimal Training and Validation Strategy for Neural Networks When Problems Are Ill-Posed," First Award NSF-EPSCoR, May 1995–August 1996, \$34,731.

"Analysis and Maximization of Large Complex Industrial Systems through Distributed Simulation," Wichita State University, February–December 1996, \$4,500.

"Analysis and Maximization of Large Complex Industrial Systems through Distributed Simulation," NSF as Planning Grant, September 1995–September 1996, \$18,000.

RESEARCH GRANT PROPOSALS IN PREPARATION

"The Sustainability of Intersecting Infrastructures to Support Bio-Jest Fuels for Military Use," NSF, Twomey (PI), Overcash, and Durham, \$2.0 million.

"Planning Grant: Kansas Biofuels Research Center," KS BioScience Authority, Subramaniam (KU), Madl (KSU), Twomey (WSU), \$200,000, planning grant will be used to develop \$4.0 million proposal.

LABORATORY DIRECTOR

Housed in the College of Engineering's Research Building (room 209), the Laboratory for Sustainable Engineered Systems promotes the advancement of knowledge, understanding, and education of environmentally sustainable engineered systems (manufacturing and production systems, and renewable energy systems) through interdisciplinary teams of faculty, students, industrial partners and community volunteers. The laboratory's long-term goals are to create new knowledge, provide graduate students with in-depth or broad-based knowledge, educate the community, and provide advice to industry and policy makers. The laboratory's research objective is to create or modify existing physical, chemical, biological or operational systems such that they have either a minimal or favorable impact on health and the environment. The laboratory (1,400 square feet) provides workspace for 24 graduate and undergraduate students.

Research in the laboratory is currently funded by seven awards from the National Science Foundation and the Department of Energy. Current research activities include the development of a DOE industrial energy assessment center, operational methods to minimize energy consumption of production systems, an intelligent machine controller to minimize energy consumption of manufacturing equipment, the life-cycle assessment of dry machining vs. machining with cutting fluids, green logistics, distribution and infrastructure for the ethanol industry, and introduction of sustainability principles into the engineering curriculum (education).

COURSES DEVELOPED AND TAUGHT

Introduction to Engineering (Eng 101)

Probability and Statistics I (IME 254)

Probability and Statistics II (IME 524)

Information Systems (IE 556)

Systems Simulation (IME 565)

Fundamentals of Neural Networks (IME 877)

Introduction to Intelligent Computing (IE 880R)

Modeling and Analysis of Discrete Systems (IME 865)

GRADUATE AND UNDERGRADUATE RESEARCH

Current Students, Subject Area, and Intended Degree

Kalla, D. committee networks modeling of composite materials, Ph.D., co-chair with J. Ahmed

Asmatulu, E., biofuels logistics, Ph.D.

Iqbal, Q., new markets for ethanol co-products, M.S. thesis option

Dhekane, G., LCA of drilling, M.S. thesis option

Reiger, K., NSF REU student

Vause, H., NSF REU student

Alexander, J.M., NSF REU student

Hoy, L., NSF REU student

Graduated Ph.D. Students

Chetchotsak, D., Improving Generalization Capability Of Neural Networks Under Conditions of Sparse Data: A New Committee Formation Approach, 2003; current employment: Assistant Professor Department of Industrial Engineering, Khan Kaen University, Khon Kaen, Thailand.

Sirphala, P., Controlling Artificial Neural Network Overtraining when Data is Scarce, 2000; current employment: Captain in Thai Air Force, Faculty in the Air Force Academy.

Graduated M.S. Thesis Students

Lodhia, P., A Macro Level Environmental Performance Comparison: Dry Machining Process Vs Wet Machining Process, 2007.

Chatterjee, S., Development of an Artificial Neural Network Model for the Prediction of Spring-Back in the Hydroforming of Al-2024-T3 Material, 2003.

Sen, S., ANN Constitutive Model for the Prediction of Material Response in High Speed Machining Processes with Aluminum 7075-T6 51, 2003, co-chair with Dr. Ahmed.

Ramaprasan, A., Employing Data Mining Techniques to Determine the Effect of Drill Bit Geometry on Its Performance, 2001.

Maradana, S., .632 Stop Training for Scare Data Sets, 2001.

Natarajan, H., Metamodel Approach to the Optimization of Stochastic Simulation, 1999 (PeopleSoft), co-chair with Dr. Cheraghi.

Ramani, B., Dimension Normalization and Representation in CAD Systems for Computer Aided Assembly Tolerance Analysis (Dimensional Control Systems, Detroit), 1996, co-chair with Dr. Cheraghi.

Graduated M.S. Project Students

Mouzon, G., Operational Methods for Minimization of Energy Consumption of Manufacturing Equipment, 2006, co-chair with B. Yildirim.

Lopez, S., Treating Multiple Refractory Epilepsy with Vegas Nerve Stimulation, A Proposed Statistical Investigation of EEG Signal for Three Types of Patients: VNS Responders, Partial Responders, and Non-Responders, 2001.

Thomson, L., Neural Network Approach to Detect Late Jobs in a KANBAN System at Boeing, 2000.

Littell, M., Investigation into Application of Hybrid Temporal Neural Networks in Economic Indicator Forecast, 1999.

Leu, Y., Artificial Neural Network Identification of Poor Quality Drill Bits, 1999.

Ali, A., Analyzing Significant Drilling Factors Using Artificial Neural Networks (People Soft), 1998.

Gottipati, V., Capacity Analysis of a Machine Cell using Simulation at Boeing Aircraft Company, Wichita, 1997.

Graduated M.S. Students in All Course Option

Shatori, P., 2007

Betnag, P., 1998

Arosemena, L., 1999

Graduated REU Students

Brian Clevenger

Rebekah Drake
Mark C. Hansen
Kristin Mehler
Sidney Niblack
Maura Pendleton
Haydee Serna
Jennifer Sutherland

INDUSTRIAL ADVISOR

Manufacturing Technology Laboratory, General Electric Company, Schenectady, NY
Manufacturing Research and Development, Boeing Corporation, Wichita, KS
Institute for Rehabilitation Research and Service, Associate Member, Wichita, KS
Michael Baker, Inc. Engineering Consulting Firm, Princeton NJ
School Bus Service, Wichita, 1998.

INVITED PRESENTATIONS AND PANEL PARTICIPANT

“Setting a Research/Education Agenda in Environmental Sustainability at Wichita State University,”
Seminar Series in Sustainability, Rochester Institute of Technology, Rochester, NY, May 2007.

Materials Assurance Panel, NSF Workshop—Complex Interacting Systems for a Sustainable Future,
Clearwater, FL, June 2007.

“Sustainable Product Choices,” Summer Girls STEP Camp, Wichita, KS, June 2007.

“Activities Related to Biofuels,” KSU-KU-WSU Bioenergy Meeting at Kansas State University, Manhattan,
KS, June 2007

“Sustainability and the Engineering Profession,” Sheppard Center, Wichita, KS, October 2007.

“LCA for the Design of Sustainable Bio-Material Products,” Plant-Based Biomaterials by Design
Symposium, Kansas State University, Manhattan, KS, January 27, 2006.

“Your Research Program,” Future Academician Colloquium, INFORMS, San Francisco, November 2005.

International Workshop on Sustainable Manufacturing, Shanghai, China, October 2005, NSF-Sponsored.

“Outside Reputation?” Session on Enhancing your Outside Reputation, IIE Doctoral Colloquium, IERC,
May 14-18, 2005. Atlanta, Georgia.

“Student Seminar, Life Beyond Ph.D.” DMII Design, Service and Manufacturing Research and Grantees
Conference, Scottsdale, AZ 2005.

“CAREER,” DMII Design, Service and Manufacturing Research and Grantees Conference, Scottsdale,
AZ, 2005.

“Broadening the Business Case,” Closed Loop Supply Chain Workshop, INSEAD, Fontainebleau France,
2004.

Global Conference on Sustainable Product Development and Life Cycle Engineering, PTZ in Berlin,
September 29–October 1, 2004.

NSF Workshop on Cyberinfrastructure, Operations Research, and Enterprise-Wide Applications, Washington, DC, August, 2004.

“Future Academician Colloquium,” INFORMS, Denver, CO, 2004.

“Neural Network Prediction of Springback,” Raytheon Corporation, Wichita, KS, with V. Madhavan, 2003.

“Neural Network Applications in Manufacturing,” University of Pittsburgh, 2000.

“Neural Networks to Detect Drill Bit Quality,” Boeing Research Teleconference, 2000.

“Intelligent Information Processing,” University of Toledo, 2000.

“Neural Network Applications in Manufacturing,” Boeing Aircraft Company, July 1999.

“Information Processing for Intelligent Manufacturing,” National Institute for Aviation Research Faculty Fellows Workshop, Wichita, KS, 1999.

“Optimal Training and Validation Strategy for Neural Networks when data is Sparse,” NSF-EPSCoR Meeting, Topeka, KS, 1999.

“Intelligent Manufacturing,” National Institute for Aviation Research Faculty Fellows Workshop, Wichita, KS, April 1998.

“Machine Calibration Inspection Systems,” Dallas INFORMS, 1997.

“Knowledge Acquisition,” Boeing Aircraft Company, Wichita, KS, 1997.

“Dimension Normalization and Representation in Cad Systems for Integrated Automated Computer Aided Assembly Tolerance Analysis,” First NIET Conference, Pittsburgh, PA, with B. Ramani and H. Cheraghi, 1996.

“The Manufacturing Metrology Projects at WSU,” Boeing Aircraft Company, with S. H. Cheraghi, 1995.

“Resampled Committee Networks,” Informs New Orleans, with A. E. Smith, Fall 1995.

“Committee Network Meta-Models of Stochastic Simulation,” INFORMS Los Angeles, with R. A. Kilmer, Spring 1995.

UNIVERSITY SERVICE

University Level

Member, Human Use Committee, 2004, 2005
 Member, Transition to Respect, 2005, 2006, 2007
 Chair, Graduate Assessment Committee, 2001
 Member, Faculty Senate, 2001
 Member, Grievance Committee, 1997, 1999, 2001
 College of Engineering Representative, Undergraduate Research Opportunity Committee, 1999–2001

College of Engineering Level

Member, Strategic Planning Task Force, 2006–present
 Member, College of Engineering Associate Dean Search Committee
 Member, Tenure and Promotion Committee, 2005

Chair, Strategic Planning Task Force, 2005
Chair, Research Thrusts Subgroup, Strategic Planning Task Force, 2005–present
Chair, Sustainability Research Thrusts Subgroup, Strategic Planning Task Force, 2005–present
Chair, COE Working Group on Technology for Sustainable Environment, 2005–07
Member, College of Engineering Dean’s Advisory Committee
Member, Matrix Committee, 2004
Member, Dean Search Committee, 2004, 2005
IMfgE Representative, Engineering Local Area Network (LAN) Steering Committee, 1998–2000

Department Level

Faculty Advisor, Society of Manufacturing Engineering, 2007
Head, Department Newsletter, 2005
Chair, Faculty Support Committee, 2005–present
Co-chair and Member, Recruitment Committee, 2004–07
Member, Tenure and Promotion Committee 2001–07
Member, Graduate Committee, 1999–2001, 2004–07
Chair, Faculty Search Committee, 1998, 1999
Member, Technician Search Committee, 1999
Member, Faculty Search Committee, 1994, 1996, 1997
Member, Curriculum Assessment Committee, 1997
Member, Workshop Committee, 1995
Member, Strategic Planning for Research Committee, 1994
Member, Engineering Faculty Awards Committee, 1994
Faculty Advisor, Student chapter of the Institute of Industrial Engineers, 1995–2001
Faculty Advisor, IIE Student Simulation Contest 1996, 1997

PROFESSIONAL SERVICE

Reviewer

Journal of Industrial Ecology
International Journal on Production Research
Simulation
Operations Research Society of America (ORSA) Journal on Computing
Advanced Manufacturing Systems
Journal of Mathematical and Computer Modeling
International Journal of Industrial Engineering
INFOR (Journal of the Canadian Operations Research Society and of the Canadian Information Processing Society)
International Journal of Industrial Engineering
American Society of Engineering Education (ASEE)
International Journal of Smart Engineering Systems
Journal of Transportation Engineering
IEEE Man, Systems, and Cybernetics

Reviewer

North Dakota NSF–EPSCoR	NSF ERC Reviewer
Robert Wood Johnson Foundation	WSU Proposal Reviewer
NSF CAREER Panel x 3	NSF I/UCRC Reviewer
NSF MUSES Panel	

Workshop Organizing Committee

“NSF-Sponsored 5th Global Conference on Sustainable Product Development and Life Cycle Engineering,” Rochester Institute of Technology, Rochester, NY, September 18–21, 2007.

“NSF Proposal Writing Workshop,” University of Alaska–Fairbanks, August 22–23, 2007.

“NSF CAREER Proposal Writing Workshop,” University of Hawaii–Hilo, March 23, 200; University of Hawaii–Mano, March 26, 2007.

“Data Mining Workshop,” INFORMS, Pittsburgh, PA; Nov 5-8, 2006.

Organizer and presenter, “NSF CAREER Proposal Writing Workshop,” University of Massachusetts, Lowell, MA, April 2006.

“NSF CAREER Proposal Writing Workshop,” Wichita, KS, March 12, 2006.

Conference Organizing Committee

Applications in Artificial Neural Networks in Engineering (ANNIE), Intelligent Engineering Systems through Artificial Neural Networks, 1997, 1998, 1999.

Professional Organization Committees

Steering Committee, Data Mining Section, INFORMS, 2003, 2004, 2005, 2006, 2007.

Community Relations Officer, Regional Chapter of the Institute for Industrial Engineers (IIE), 1996, 1997, 1998, 1999.

Conference Sessions Organized

“Education Panel: Data Mining from Statistical and OR Perspectives,” INFORMS, Pittsburgh, PA; Nov 5-8, 2006.

Conference Sessions Invited

“Sensor Applications I and Sensor Applications II,” SPIE: Optics East, Boston, MA , October 23–26, 2005.

“Neural Network Applications in Industrial Engineering,” First International Conference on Industrial Engineering Applications and Practice, Dallas, TX., 1996.

“Intelligent Manufacturing,” INFORMS, Seattle, 1998

COMMUNITY SERVICE

Member of the City of Wichita’s Cultural Funding Committee, 2005 and 2006

- Developed grant application and criterion for evaluation.
- Reviewed applications.
- Made funding recommendations to the City Council.

NATIONAL SCIENCE FOUNDATION SERVICE

Three-year Intergovernmental Personnel Act Program Director (rotating) for Manufacturing Enterprise Systems in the Design Manufacture and Industrial Innovation (DMII) Division of the Engineering Directorate at the National Science Foundation, Arlington, Virginia, August 2001–August 2004.

- Assumed leadership in launching, shaping, and managing the new Manufacturing Enterprise System’s program in design, manufacture, and industrial innovation. This included managing total grant budgets of \$7–\$10 million per year, organizing the peer review and recruiting panelists for several hundred proposals annually, and selecting and administering the 10%–20% of those individuals receiving research awards.
- Represented NSF and made presentations at numerous professional meetings, research workshops, and university site visits including the Ph.D. student colloquia at INFORMS, and IIE—all at the national and international levels.
- Assumed leadership of NSF’s Scalable Enterprise Systems (SES) initiative, which deals with modeling and information system architecture for design, planning, and control of supply chain and related extended enterprises that are widely distributed in both geography and ownership. This included managing and organizing workshops and other presentations of the work of SES grantees, and planning and leading a working group to determine new directions for research in SES.
- Assumed a co-leadership role (with D. Durham of NSF) to set an agenda for a research focus in benign manufacturing and technology for a sustainable environment. This involved making technical presentations in a variety of venues, planning and managing national and international workshops, and building partnerships with the National Academies of Engineering, the National Institute for Standards and Technology, and the Environmental Protection Agency.
- Served as DMII division coordinator for the NSF-wide CAREER grant program for outstanding young professors.
- Assumed the leadership of a joint funding activity between NSF, the Semiconductor Research Council, and International SEMATECH to create solicitation on Operational Methods for the Semiconductor Factory and the Supply Chain.
- Served as DMII representative to the NSF-wide solicitation on Human and Social Dynamics.
- Represented DMII in the development and administration of the Sensor and Sensor Network Initiative.

PROFESSIONAL EXPERIENCE

Research Specialist: Data Analyst/Manager, August 1984–December 1990

Built and managed a data analytic team for the Department of Child and Adolescent Psychiatry, University of Pittsburgh School of Medicine. Conducted statistical analysis on a variety of biological, psychosocial, and EEG sleep measures, resulting from several multi-million dollar NIMH-funded research grants. Supervised the development and implementation of a data management system. As a result, co-authored six publications in prominent psychiatric journals.

Project Coordinator, May 1981 to July 1984

NIMH-funded research grants for the Department of Psychiatry, University of Pittsburgh School of Medicine. Managed a research team, conducted statistical analysis, conducted assessments, and developed psychosocial survey instruments.

Research Associate Senior, September 1978 to April 1981

NIMH-funded research grants for the Department of Psychiatry, University of Pittsburgh School of Medicine. Managed a partial day hospital for chronic schizophrenics.

RESULTING PUBLICATIONS

Garcia, M., Ryan, N.D., Rabinovich, H., Ambosini, P., Twomey, J.M., Iyengar, S., Novacenko, H., Nelson, B., and Puig-Antich, J.M., 1991, "Thyroid stimulating hormone response to thyrotropin in prepubertal depression," *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, pp. 914–918.

Birmaher, B., Stanley, M., Greenhill, L., Twomey, J.M., Gavrilescu, A., and Robinovich, H., 1990, "Platelet imipramine binding in children and adolescents with impulsive behavior," *Journal of the American Academy of Child and Adolescent Psychiatry*, 29, pp. 914–918.

Puig-Antich J., Geotz, D., Davies, M., Kaplan, T., Davies, S., Ostrow, L., Anis, L., Twomey, J.M., Iyengar, S., and Ryan, N.D., 1989, "A controlled family history study of prepubertal major depressive disorder," *Archives of General Psychiatry*, 46, pp. 406–418.

Dahl, R., Puig-Antich, J., Ryan, N.D., Nelson, B., Novacenko, H., Twomey, J.M., Williamson, D., Goetz, R., and Ambrosini, P.J., 1989, "Cortisol secretion in adolescents with major depressive disorder," *Acta Psychiatrica Scandinavica*, 80, pp. 18–26.

Puig-Antich, J., Dahl, R., Ryan, N.D., Novacenko, H., Geotz, D., Geotz, R., Twomey, J.M., and Klepper, T., 1989, "Cortisol secretion in prepubertal children with major depressive disorder," *Archives of General Psychiatry*, 46, pp. 801–809.

Ryan, N.D., Puig-Antich, J., Rabinovich H., Robinson D., Ambrosini P.J.M., Nelson, B., Iyengar S, and Twomey, J.M., (1987), "The clinical picture of major depression in children and adolescents," *Archives of General Psychiatry*, 44, pp. 854–861.