

JANET M. TWOMEY, Ph.D.

Associate Professor and National Institute for Aviation Research Fellow
Duane and Thelma Wallace Outstanding Educator Award for Research Excellence, 2001.
A.D. Welliver Boeing Faculty Fellow, 1999
Industrial and Manufacturing Engineering
Wichita state University

Business Address 1:

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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 August 2000 – present. Industrial and Manufacturing Engineering, Wichita State University- Received NSF CAREER Award – 1998- present

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

Assistant Professor August 1994 - 2000. Industrial and Manufacturing Engineering, Wichita State University

GRADUATE ADVISING

Graduated Ph.D. Students

- Sirphala, P. (2000), “Controlling Artificial Neural Network Overtraining when Data is Scarce.”
Current employment: Captain in Thai Air Force, Teaching classes in Neural Networks
- Chetchotsa, Danaipong (2003) Improving Generalization Capability Of Neural Networks Under Conditions Of Sparse Data: A New Committee Formation Approach “
Current employment: Assistant Professor Dept. of Industrial Engineering, Khon Kaen University, Khon Kaen, Thailand.

MS Theses Completed

- Ramani, B., "Dimension Normalization and Representation in CAD Systems for Computer Aided Assembly Tolerance Analysis," 1996, (Dimensional Control Systems, Detroit), Co-chaired with Dr. Cheraghi.
- Natarajan, H., "Metamodel Approach to the Optimization of Stochastic Simulation", 1998, (PeopleSoft). Co-chaired with Dr. Cheraghi.
- Srinivasu, M., ".632 Stop Training for Scare Data Sets", 2001.
- Ramaprasan, A., "SOM to Determine Important Drill Bit Factors", 2002.
- Chatterjee, S., "Development of an Artificial Neural Network Model for the Prediction of Springback 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-chaired with Dr. Ahmed.

MS Projects Completed

- Leu, Y., "Artificial Neural Network Identification of Poor Quality Drill Bits", 1999.
- Gottipati, V., "Capacity Analysis of a Machine Cell Using Simulation at Boeing Aircraft Co., Wichita," 1997.
- Ali, A., "Analyzing Significant Drilling Factors Using Artificial Neural Networks," 1998.
- Littell, M., "Investigation into Application of Hybrid Temporal Neural Networks in Economic Indicator Forecast", 1999.
- Thomson, L., "Neural Network approach to detect late jobs in a KANBAN system at Boeing", 2000.
- Lopez, Stacy, "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.

JOURNAL ARTICLES

Ahmad, J. and Twomey, J. (accepted), "ANN constitutive model for high strain-rate deformation of Al 7075", *Transactions of NAMRI/SME*. (nominated for best paper award).

Cheraghi, S.H., Chen, X., Twomey, J.M., 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), "Dimension normalization and representation in cad systems for integrated automated computer aided assembly tolerance analysis," *International Journal of Production Research*, **36**, pp. 2891-1910.

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), "An artificial neural network prediction model for determining peak pinch strength," *International Journal of Industrial Ergonomics*, **18**, 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.

JOURNAL ARTICLES IN PREPARATION

Twomey, J., Cheraghi, H., and Ali, A (submitted January 2005) "Neural networks to identify important drill bit factors", *International Journal of Production Research*.

Maradana, S., Twomey, J., Ahmad, J. (submitted January 2005) "Toward an automatic method of network construction and validation using the .632e error estimator", *Simulation*

Chetchotsak, D. and Twomey, J. (submitted January 2005) "Improving committee networks' performance under sparse data conditions: The biased regression and bootstrap error estimation approaches" *IEEE Man Systems and Cybernetics*

Ahmad, J. and Twomey, J. (submitted January 2005) "Neural network constitutive modeling", *Machining Science and Technology*

Twomey, J.M., and Cheraghi, S.H. (in preparation) "Data selection and analysis to identify the quality of drill bits using neural networks, *International Journal of Production Research: Special Issue on Data Mining*.

Madhavan, V. and Twomey, J (in preparation) "Stacked committee networks for the prediction of spring back".

REFEREED CONFERENCE PROCEEDINGS

Chetchotsak, D. and Twomey, J. (2004) "Performance Sensitivity Analysis of the r-k Class Estimator Committee (RKC)" *Intelligent Engineering Systems Through Artificial Neural Networks, Volume 14*, ASME Press.

Whitman, L., Madhavan, V., Malzahn, D., Twomey, J., & Krishnan, K. (2002) "Virtual Reality Mega-Case Throughout the Curriculum." Proceedings of the 2002 Frontiers in Education Conference, November, 6-9, 2002.

Whitman, L., Madhavan, V., Malzahn, D., & Twomey, J. (2002) "Teaching Process Design using Virtual Reality." Proceedings of the American Society of Engineering Education, June 17-18, 2002.

Whitman, L., Madhavan, V., Malzahn, D., Twomey, J., & Krishnan, K. (2002) "Using Virtual Reality to Address Competency Gaps." Proceedings of the American Society of Engineering Education, June 17-18, 2002.

Whitman, L., Madhavan, V., Malzahn, D., & Twomey, J. (2002) "Virtual Reality Model to Aid Case Learning." Proceedings of the Industrial Engineering Research Conference, May, 19-21, 2002.

Sen, S., Twomey, J. and Ahmad, J. (2002) "Development of an Artificial Neural Network Constitutive Model for Aluminum 7075 Alloy," 2002 IERC Conference, May 19, 2002.

Sen, S. and Twomey, S. (2002) "Parameter estimation using connectionist constitutive model for aluminum 7075 Alloy," *Intelligent Engineering Systems Through Artificial Neural Networks, Volume 12*, ASME Press.

Chetchotsak, D. and Twomey, J. (2002) "Improving generalization when data is scarce," *Intelligent Engineering Systems Through Artificial Neural Networks, Volume 12*, ASME Press.

Maradana, S. and Twomey, J. (2001) "0.632e stop training method for neural networks under the conditions of sparse data" Industrial Engineering Research Conference, 2001.

Chetchotsak, D., Twomey, J., 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, 2001.

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

Srinivasu, M., Twomey, J.M., and Cheraghi, S.H. (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*.

Sutherland, J., Twomey, J.M., and Cheraghi, S.H. (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*.

Liu, Y., Twomey, J.M., Cheraghi, S.H., (2000), "Artificial Neural Network Classification of Drill Bit Quality," *Intelligent Engineering Systems Through Artificial Neural Networks, Volume 9*, ASME Press.

Cheraghi, S. H., Twomey, J. M., Ksishnan, K., and B. Bahr, "An Automated System for Drill Bit Quality Determination," (1999), *SAE General, Corporate and Regional Aviation Meeting and Exposition (GCRAM)*, April, Wichita, Kansas.

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 1998*, pp. 95-100.

Ali, A., Twomey, J. M., Maradana, S., Cheraghi, S. H., and M. C. Liu, (1999) "Identification of Important Drill Bit Characteristics in the Prediction of Drilling Forces Using Neural Networks," 8th Industrial Engineering Research Conference, May 1999, Phoenix, Arizona.

Cheraghi, S. H., Twomey, J. M., Krishnan, K., and B. Bahr, (1999) "An Automated System for Drill Bit Quality Determination," 1999 SAE General, Corporate and Regional Aviation Meeting and Exposition (GCRAM), April 1999, Wichita, Kansas..

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 1998*, pp. 95-100.

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

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

Kattel, B.P., Twomey, J.M., and Fernandez, J.E., (1996), "Application of neural networks to ergonomics: The prediction of maximum grip strength." The 1st International Conference on Industrial Engineering Applications and Practice, pp. 900-905.

Sivasubramanian, K. and Twomey, J.M., (1996), "A neural network approach to model over potential in electrochemical machining applications." The 1st International Conference on Industrial Engineering Applications and Practice, pp. 906-911.

Gottipati, V.H. and Twomey, J.M., (1996), "Neural network approximation model of as/rs simulation." The 1st International Conference on Industrial Engineering Applications and Practice, pp. 912-917.

Twomey, J. M. and Smith, A. E., (1996), "Artificial Neural Network Approach to the Control of a Wave Soldering Process," Intelligent Engineering Systems Through Artificial Neural Networks, Volume 6, ASME Press, 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, Volume6, ASME Press, pp. 787-792.

Twomey, J. M. and Smith, A. E., (1995), "Committee Networks by resampling," Intelligent Neural Engineering Systems Through Artificial Networks, Volume 5, ASME Press, pp. 153-158.

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

Eksioglu, M. Fernandez, J.E., 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, 1995, pp. 101-106.

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

Huston, T., Smith, A., & 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. E., (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. E., and Redfern, M.S., (1993), "A neural network model of the dynamic coefficient of friction," Proceedings of the Second IIE Research Conference, Los Angeles, CA, pp. 187-191.

Twomey, J. M. and Smith, A. E., (1992), "An examination of performance measures for pattern classification backpropagation neural networks," Intelligent Engineering Systems Through Artificial Neural Networks: Volume 2, ASME Press, pp. 343-348.

BOOK CHAPTER

Methods for estimating the true performance of supervised artificial neural networks. (1997) *Artificial Neural Networks for Civil Engineers: Fundamentals and Applications*. N. Kartam, I. Flood and J. Garrett (Eds.).

TECHNICAL REPORTS

Twomey, J.M., "Neural Network Strategy for Manufacturing Processes when Data is Sparse," *Proceedings of 2000 NSF Design and Manufacturing Grantees Conference*, CD-ROM. 2000

Year-end report of "Neural Network Strategy for Machining when Data is Sparse," NSF-CAREER Award Aug. 1999.

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

Twomey, J.M., "Analysis of Large Complex Industrial Systems Through Distributed Simulation Models," *Proceedings of 1998 NSF Design and Manufacturing Grantees Conference*, CD-ROM, 1998.

Twomey, J.M., (1998) "Analysis of Large Complex Industrial Systems Through Distributed Simulation Models," *Proceedings of 1997 NSF Design and Manufacturing Grantees Conference*, pp. 135-136.

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

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

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

"Knowledge Acquisition for Aerospace Manufacturing," Manufacturing Research and Development, Boeing Airplane Co. Wichita, KS, Sept. 1997.

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

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

INVITED PRESENTATIONS

- "Broadening the Business Case", Closed Loop Supply Chain Workshop, INSEAD, Fontainebleau France, 2004.
- Global Conference on Sustainable Product Development and Life Cycle Engineering, Sept. 29th – Oct. 1st, 2004 at the PTZ in Berlin
- NSF Workshop on Cyberinfrastructure, Operations Research, and Enterprise-wide Applications, Washington DC, August, 2004
- "Future Academician Colloquium", INFORMS, Denver, Colorado, 2004
- "Student Seminar, Life Beyond PhD" 2005, DMII Design, Service and Manufacturing Research and Grantees Conference, Scottsdale, Arizona

- "CAREER", 2005, DMII Design, Service and Manufacturing Research and Grantees Conference, Scottsdale, Arizona
- With V. Madhavan "Neural Network Prediction of Springback", Raytheon Corp, 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, July 1999.
- "Information Processing for Intelligent Manufacturing", National Institute for Aviation Research Faculty Fellows Workshop, 1999.
- "Optimal Training and Validation Strategy for Neural Networks when data is Sparse", NSF-EPSCoR Meeting, Topeka, 1999.
- "Intelligent Manufacturing", National Institute for Aviation Research Faculty Fellows Workshop, April 1998.
- "Machine calibration inspection systems", Dallas INFORMS, 1997.
- "Knowledge Acquisition", Boeing, 1997.
- With Ramani, B., and Cheraghi, H. "Dimension normalization and representation in cad systems for integrated automated computer aided assembly tolerance analysis," 1st NIET Conference, Pittsburgh, PA, 1996.
- With Cheraghi, S.H. "The Manufacturing Metrology Projects at WSU", Boeing, 1995.
- With Smith, A. E., "Resampled committee networks," Informs New Orleans Fall 1995.
- With Kilmer R.A. "Committee network metamodels of stochastic simulation," Informs Los Angeles Spring 1995.

RESEARCH GRANTS

Approved - PI as Sole Investigator

- "Neural Network Strategy for Machining when Data is Sparse," (\$270,000), NSF-CAREER Award (and supplements) - Sept 1998 - Aug. 2002.
- "Optimal Training and Validation Strategy for Neural Networks When Problems are Ill-Posed," (\$6,000), Renewal of First Award NSF-EPSCoR, Oct.- Dec. 1996.
- "Optimal Training and Validation Strategy for Neural Networks When Problems Are Ill-Posed," (\$34,731), First Award NSF-EPSCoR March - Sep. 1996.
- "Analysis and Maximization of Large Complex Industrial Systems through Distributed Simulation," (\$18,000), NSF as Planning Grant, Oct. 1995 - Oct 1996.

Approved – Team effort

- "Innovation in Aircraft Manufacturing through System-wide Virtual Reality Models and Curriculum Integration." (\$597,810) NSF-PFI, 2002-2004 (V. Madhavan, PI).
- "Design for Manufacturing," (\$147,400), ADMARC, April 2000 – March 2003, (Dr. Krishnan, Principal Investigator).
- "Automated Drill Bit Quality Determination," Boeing and Cessna (\$280,000), Manufacturing Innovation and Development Initiative in Aviation at the National Institute for Aviation Research, April 2000 – March 2001, (with H. Cheraghi).
- "An Investigation of the Effect of Heat Affected Zone on the Fatigue Properties of Laser-cut Aerospace Alloys," (\$54,960), Manufacturing Innovation and Development Initiative in Aviation at the National Institute for Aviation Research, April 1999 – March 2000, (Dr. J. Talia, Principal Investigator).
- "Increased Production Rate Via High Speed Drilling," (\$69,181), Manufacturing Innovation and Development Initiative in Aviation at the National Institute for Aviation Research - Joint with Boeing Aircraft Co, Wichita and Cessna, May - December 1998, (Dr. Bahr, Principal Investigator).
- "Engineering Research/Educational Laboratory for the Study of Advanced Materials Processes and High Performance Aeronautical Materials," (\$39,961), NSF-EPSCoR, 1997, (Dr. Chaudhuri, Principal Investigator).

- "Analysis and Maximization of Large Complex Industrial Systems Through Distributed Simulation," (\$4,500), Wichita State University, Feb-July, 1996.
- "An Investigation into the Control of the Vagus Nerve Stimulator for the treatment of Epileptic Seizures," (\$4,500), ORA, Wichita State University, Jan –June 2000 , (with J. Steck).
- "Playing a Musical Synthesizer with EEG Control: A Musical Instrument for Severely Disabled Individuals," (\$42,779), US department of Education – National Institute on Disability and Rehabilitation Research, 1999, (with J. Steck).

INDUSTRIAL ADVISOR

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

SERVICE AT THE NATIONAL SCIENCE FOUNDATION

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

1. Assumed leadership in launching, shaping, and managing the new Manufacturing Enterprise System program in Design, Manufacture, and Industrial Innovation. This included managing total grant budgets of \$7-10 million per year, including organizing the peer review and recruiting panelists for several hundred proposals annually, and then selecting and administering the 10-20% of those receiving research awards.
2. Represent NSF and make presentations at numerous professional meetings, research workshops, and university site visits including the Ph.D. student colloquia at INFORMS, and IIE. All done at national and international level.
3. 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 the management and organization of workshops and other presentations of the work of SES grantees. Currently planning and leading a working group to determine new directions for research in SES.
4. Assumed co-leadership role (with R. Rardin) of agenda setting activity for the role of engineering in health care delivery. This includes the management of a National Academy of Engineering study and a World Technology (WTEC) on the same topic. The results will be a multi-million dollar joint solicitation between the NSF, the National Institutes of Health and the Department of Defense, to fund basic research in Health Care Delivery.
5. Assumed co-leadership role (with D. Durham of NSF) to set agenda for research focus in benign manufacturing and technology for a sustainable environment. This involves technical presentations in a variety of venues, the planning and management of 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.
6. DMII division coordinator for the NSF-wide CAREER grant program for outstanding young professors.
7. Assumed the leadership of a joint funding activity between NSF, the Semiconductor Research Council and International SEMATECH to create solicitation: Operational Methods for the Semiconductor Factory and the Supply Chain.

OTHER PROFESSIONAL SERVICE

Organized Conference Sessions

- Joint session with Boeing Wichita on Intelligent Manufacturing, Informs Seattle, Fall 1998.
- Joint session with Boeing, Wichita on Neural Network Applications in Industrial Engineering at The 1st International Conference on Industrial Engineering Applications and Practice, December 4-7, 1996, Houston TX.
- Conference on Artificial Neural Networks in Engineering, Nov. 1996, St. Louis, MO: Organizing Committee.

Organizing Committee

- Applications in Artificial Neural Networks in Engineering (ANNIE), Intelligent Engineering Systems through Artificial Neural Networks, 1996, 1997, 1998, 1999.

Invited Chaired Conference Sessions

- 26th North American Manufacturing Research Conference of SME, 1997.
- IIE Research Conference, 1999.
- ANNIE, Intelligent Engineering Systems through Artificial Neural Networks, 1995, 1996, 1997, 1998, 1999.
- The 1st International Conference on Industrial Engineering Applications and Practice, 1996.

Conference Sessions Organized, Invited

- "Neural Network Applications in Industrial Engineering" at The 1st International Conference on Industrial Engineering Applications and Practice, 1996.
- "Intelligent Manufacturing": INFORMS Seattle, 1998.

Journal Reviews

- 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

Regular Service on Proposal Review Panels for Granting Agencies

- North Dakota NSF – EPSCoR.
- NSF- CAREER Panels.
- NSF- Program Panels

National Survey

Invited contributor to two national surveys sponsored by NSF, DARPA, DOE, and NIST: "Integrated Manufacturing Technology Roadmap Initiative: Information Systems, and Modeling and Simulation".

UNIVERSITY SERVICE RELATED TO RESEARCH

- Committee member to create Kansas Bioscience and Innovation Roadmap

- University Human-Use Committee
- College of Engineering Representative, Undergraduate Research Opportunity Committee, 1999 – present.
- Chair, Graduate Assessment Committee

PROFESSIONAL AFFILIATIONS

- Institute of Industrial Engineers
- Society of Women Engineers
- American Society for Engineering Education

PATENTS

“Computer Aided Assembly Tolerance Analysis Software,” Commercialization Agreement with Systems Technology, Bloomfield Hills, Michigan, 1998.

ACADEMIC HONORS AND AWARDS

- Duane and Thelma Wallace Outstanding Educator Award for Research Excellence, 2001.
- National Institute for Aviation Research Fellow, 2000-present.
- A.D. Welliver Boeing Faculty Summer Fellow, 1999. This award exposed eleven competitively selected Faculty Fellows from across the nation to key elements of industrial competitiveness. The objective of which is to improve engineering curriculum.
- Faculty Associate, National Institute for Aviation Research, 1997-1999.
- Nominated for the Board of Trustees Excellence in Teaching (BOT) for academic years 1997, 1999, and 2000.
- National Science Foundation (NSF) CAREER Award, 1998.

PROFESSIONAL EXPERIENCE

Research Specialist: Data Analyst/Manager: August 1984 to December 1990.

Built and managed data analytic team. Department of Child and Adolescent Psychiatry, University of Pittsburgh's 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 data management system. Work resulted in six co-authored publications in prominent psychiatric journals.

Project Coordinator. May 1981 to July 1984.

NIMH funded research grants: Department of Psychiatry, University of Pittsburgh School of Medicine. Managed research team, conducted statistical analysis, conducted assessments, developed psychosocial survey instruments.

Research Associate Senior September 1978 to April 1981.

NIMH funded research grants: 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., Iyengar, S., Novacenko, H., Nelson, B., and Puig-Antich, J., (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., Gavrilescu, A., 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., 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., Williamson, D., Goetz, R., and Ambrosini, P.J., (1989), "Cortisol secretion in adolescents with major depressive disorder," *Acta Psychiatr*, 80, pp. 18-26.

Puig-Antich, J., Dahl, R., Ryan, N.D., Novecenko, H., Geotz, D., Geotz, R., Twomey, J., 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., Nelson, B., Iyengar S, and Twomey, J., (1987), "The clinical picture of major depression in children and adolescents," *Archives of General Psychiatry*, 44, pp. 854-861.