Russell R. Barton

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Russell Barton is Program Director for Manufacturing Enterprise Systems and Service Enterprise Systems at the National Science Foundation. He is on temporary assignment from the Smeal College of Business, funded by a 12-month grant from NSF. In this role he is responsible for managing a research portfolio of approximately $8 million annually in support of academic research in manufacturing and services management across the country. He is also Professor of Supply Chain and Information Systems in the Smeal College of Business at Penn State. Prior to accepting his NSF appointment, he was Associate Director of the Center for the Management of Technological and Organizational Change, and Co-Director of the Master of Manufacturing Management degree program. He remains the Smeal College liaison for an inter-college and inter-university effort to develop graduate curricula for interdisciplinary design (publications 45, 99 and 100). From 2002-2005 he served as associate dean for research and Ph.D./M.S. programs. In this role, he supported and coordinated the research activities of over ninety faculty and ten research centers in the Smeal College, with over $6 million in external funding. He managed the promotion and tenure, sabbatical, internal research award, and doctoral and masters processes, and developed new college processes for post-tenure and administrative reviews. He was a professor in the Department of Industrial and Manufacturing Engineering at Penn State for eleven years prior to joining Smeal, and was professeur invité in the product development and innovation laboratory at École Centrale Paris in the 1998-1999 academic year. He began his academic career at Cornell University in the School of Operations Research and Industrial Engineering after eleven years in industry and consulting.

Dr. Barton's research has focused on the interface between applied statistics and product design and manufacturing. He developed new accelerated testing methods to prove reliability of the first solid state power amplifiers in commercial communications satellites, and developed statistical methods to monitor complex multidimensional manufacturing processes including video displays and surface mount assemblies, and new modeling and optimization methods for simulation-based design. He has received thirty grants supporting research and teaching totaling approximately $2 million, including ten from the National Science Foundation. He has over 125 technical publications.

Dr. Barton has taught courses in statistics and quality, operations management, new product development, optimization, and simulation at the undergraduate and graduate levels, and has co-authored continuing engineering education courses used at RCA and GE. He has received seven awards for teaching and curriculum development. He holds a B.S.E.E. from Princeton and M.S. and Ph.D. degrees from Cornell.

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EMPLOYMENT AND EDUCATION SUMMARY

2010-present: **Program Director, National Science Foundation**.

Supports research in manufacturing and services management. Budget of approximately $8 million annually. Oversight of 200 proposals and the invitation of 100 experts for proposal review annually. Participation in policy discussions on National priorities in manufacturing and services research. Outreach to universities through visits and presentations, and to professional societies at conferences.

2005-present: **Professor of Supply Chain and Information Systems, Smeal College of Business, The Pennsylvania State University**.

Teaching graduate courses in discrete-event simulation, new product development and operations management, and an undergraduate introduction to statistics. Department responsibilities have included co-chairing the Smeal Chair search committee and chairing the candidacy examination restructuring committee. Elected by College faculty to the faculty advisory committee, the graduate policy committee and the promotion and tenure committee (including service as chair). Affiliate faculty member of the Center for Supply Chain Research, with approximately forty industry members and a budget of over $1 million. Received two National Science Foundation research grants totaling approximately $200,000. Spent Fall 2009 as a visiting researcher at Berkeley, Iowa State and Northwestern as part of a sabbatical semester.

2006-2010: **Co-Director, Master of Manufacturing Management Degree Program**.

Collaborative management with a college of engineering co-director of a one-year inter-college professional Master of Manufacturing Management degree program (SME LEED award in 2000). Program focus is manufacturing engineering, manufacturing management, lean six sigma tools, and leadership, communication and teamwork. Three dedicated staff/faculty, and an additional seven affiliated faculty. Average program size is 30 students. Develop relations and interact with fourteen-member industry advisory board, providing internships and $50,000 in scholarship assistance annually. Plan and execute short and extended plant visits and assessments. Plan annual summer curriculum improvement retreat involving all stakeholders.

Associate Director, Center for the Management of Technological and Organizational Change.

Coordinate participation of MMM students in Center activities, including the twice-annual *Advanced Manufacturing Forum*, where industry presenters describe the impact of organizational and technological innovations on factory operations. The Center also sponsors webinars on topics of interest approved by the industry board members. Recent webinar themes were sustainability initiatives and maintaining productivity gains from lean manufacturing.

Previous Positions

2002-2005: **Associate Dean for Research and Ph.D./M.S. Programs, Smeal College of Business**.

Supported and coordinated the research activities of over ninety faculty and ten research centers in the College, with over $6 million in external funding. Managed key administrative processes related to faculty, including promotion and tenure, sabbatical applications, and the allocation of over $400,000 of internal research awards, including the development and implementation of two new small award programs for faculty and doctoral students. Managed changes to the Ph.D. program in curriculum, minority recruiting, benchmarking, application processing, student and program evaluation, and student relations. Recruited and advised minority doctoral candidates. Sponsored seminars and advised faculty on external research funding opportunities, with approximately $2 million in new awards from NSF and NIST over three years. Successful nominations for two university-level faculty awards: Distinguished Faculty and Faculty Scholar. Promotional brochures for the Ph.D. program and College research centers and increased faculty-center interaction through an annual research fair. Revised College faculty review processes, creation of example promotion and tenure evaluation sessions for junior faculty, definition of policies for post-tenure reviews and of policies for administrative reviews. Chaired the search for a new executive director for the eBusiness Research Center, and was an external reviewer for the Rutgers Business School.

Employment and Education Summary (cont.)

2002-2005: **Professor of Management Science, Smeal College of Business, The Pennsylvania State University**.

Teaching an undergraduate writing-intensive course in quality management and a graduate course in new product development. Received the American Statistical Association Section on the Physical and Engineering Sciences Outstanding Presentation Award, 2002.

1990-2001: **Associate Professor (1990-1998), Professor (1998-2001) of Industrial and Manufacturing Engineering, The Pennsylvania State University**.

Taught undergraduate courses in optimization, statistics and concurrent engineering, and graduate courses in simulation-based design and the design of experiments. Three of these were newly created courses: a laboratory-based course in engineering statistics (continues to be offered), a case-studies course in concurrent engineering (continues to be offered), and an interdisciplinary graduate course on using simulation models for engineering design using real simulation models provided by industry (also offered at Cornell, Georgia Tech and Purdue). Founding member of the Laboratory for Intelligent Systems and Quality (Industrial Engineering), and member of the Engineering Design Optimization Group (Mechanical Engineering). Chair of the IME ABET evaluation preparation team, 1999-2001, and member, department head search, promotion and tenure and administrative review committees. College-elected member of the Graduate Council, the faculty advisory and deliberative body for Penn State's Graduate School. Received eight National Science Foundation awards for research and curriculum development, and seven teaching awards. One of three faculty initiators of the Learning Factory curriculum development project, developed and taught two of five courses related to its Product Realization minor. The collaborative development of the Learning Factory concept by Penn State, the University of Washington, the University or Puerto Rico Mayagüez and Sandia Laboratories received the Boeing Outstanding Educator Award in 1998 and the National Academy of Engineering Gordon Prize in 2006. External reviewer for the New Product Design Program (Labo. Conception de Produits et Innovation) at École Nationale Supérieure d'Arts et Métiers (ENSAM) in Paris. Committee member for three doctoral students in France: two at École Centrale, one as committee president; and one at ENSAM, Paris.

1998-1999: **Professeur Invité, Laboratoire Productique Logistique, École Centrale Paris**.

Sabbatical research with Bernard Yannou on metamodel-based engineering design. NSF-funded project also supported a Penn State doctoral student, Martin Meckesheimer, who received a DEA from École Centrale that year. Delivered four seminars in English and French. First collaborative research between École Centrale and Penn State, and first full-year sabbatical for the College of Engineering with salary supplement from an NSF grant. Subsequently, Yannou visited Penn State for the Fall 2001 semester, and four other Penn State engineering faculty visited École Centrale.

1987-1990: **Visiting Associate Professor, School of Operations Research and Industrial Engineering, Cornell University**.

Taught undergraduate courses in probability, and advanced optimization: integer, nonlinear, dynamic and large-scale linear programming. Graduate case study course in operations analysis and improvement, including arranging for local cases including bank operations, hospital emergency room operations, and classroom scheduling. Research focused on design of experiments for large-scale supercomputing applications, supported by the Cornell National Supercomputing Facility.

1987-1990: **Laboratory Director, Cornell Computational Optimization Project**.

Development and management of an advanced computational optimization laboratory. Six faculty, fifteen researchers. Arranged research seminars, oversaw preparation and publication of a report series, and assisted in planning and logistics for an NSF-sponsored international combinatorial optimization conference.

Employment and Education Summary (cont.)

1978-1987: **Member of Technical Staff, RCA David Sarnoff Research Center, Princeton, NJ**.

Developed and applied process optimization algorithms to the design of solar cells (diffusion length), videodiscs (warp) and electron guns (spot size). Systems analysis for the design process for picture tubes, broadcast systems equipment. Design of software and processes for videodisc testing and amplifier reliability testing. Management studies of call center telecommunication needs, and Japanese new product development and manufacturing processes. In manufacturing consulting, developed algorithms for automated setting of computer monitor convergence to reduce setup time by 86%, and probabilistic assessment of method allowing 87% reduction in videodisc test time.

1977-1978: **Operations Research Scientist, Mathematica, Princeton, NJ**.

Identified and analyzed Benders decomposition solution methods for large scale nonlinear network flow models. Developed risk analytics toolkit for large insurance brokerage firm in New York City, allowing custom design of self-insurance packages. Data mining for Federal workers compensation claim data.

1978: **Ph.D. Operations Research, Cornell University**.

Thesis: A Failure Rate Regression Model for the Evaluation of Post-Release Ex-offender Behavior.

Advisors: Bruce Turnbull, Lionel Weiss.

1976-1977: **Operations Research Scientist, The Mentoris Company, Princeton, NJ**.

Statistical models applied to military and health care operations.

1975-1976: **Operations research scientist, ECON, Incorporated, Princeton, NJ**.

Economic benefit models for applications of synthetic aperture radar data. Statistical models for evaluation of new prison industry initiatives.

1975: **M.S. Operations Research, Cornell University**.

Supported by a teaching assistantship. Assisted for courses in optimization and game theory.

1973: **B.S.E.E. Electrical Engineering, Princeton University (with honors)**.

National Merit Scholarship.

Consulting and Delivery of Professional Short Courses

Statistical Methods and Design of Experiments - Clients include AT&T, Amerikohl, General Motors, Kodak, Lockheed-Martin, Quest, SRI International, Swanson Analysis Systems (ANSYS), and the U.S. Army Electronics Technology and Devices Laboratory.

Short Course: Graphical Tools for Experimental Design - Clients include the Operations Research Society of America, Owens Corning Fiberglass, the Professional-Industrial Council of Centre County, the U.S. Army Concepts and Analysis Agency, and the U.S. Army Research Office.

Short Course: Statistics for Productivity (with M.J. Chandra) - Clients include ATOtech, Echo Ultrasound, Fenner Manheim, Stackpole. Also presented through the Penn State Continuing Education office.

Short Course: Concurrent Engineering and Design for Manufacturing (with E.A. Lehtihet) - C-COR.

SERVICE

University Service

2002-2005: **University Research Council**.

Ex-officio member. Twenty-four-member council consisting of associate deans for research, directors of major research institutes, led by the Vice President for Research. Critical issues during this time were implications of the Patriot Act on research publication, university-wide response to new research initiatives related to homeland security, changes in overhead policy for university research centers, and coordination of research equipment purchases.

2002-2005: **University Graduate Advisory Council**.

Ex-officio member. Deliberative group of administrators of college graduate programs. University-wide graduate program reviews were conducted. The structure and content of candidacy and comprehensive examinations were reviewed for consistency and alignment with similar examinations at other CIC schools. Program structures were reviewed in preparation for the National Research Council assessment of research doctorate programs. The Council advised on new initiatives in electronic applications and Web advertising through gradschools.com. The Council also served as a vehicle to convey university-level initiatives and policies to individual graduate programs at the college level, and to bring college-level concerns and requests to a broader audience.

1997-2001: **University Graduate Council**.

Elected position representing the College of Engineering. Consultative and deliberative body for the Graduate School. Served on Graduate Programs Committee, reviewing proposals for new and revised graduate programs, and on Graduate Fellowships Committee, selecting candidates for University Graduate Fellows.

1990-1992: **University Final Examination Scheduling Task Force**.

Task force lead. Resulted in changes to examination scheduling policies that previously penalized faculty who requested alternate seating. Revised policy continues to be used.

College and Department Service

2007-2010: **Smeal College Graduate Policy Committee**.

Elected position to review proposals for new or revised graduate courses, programs or policies.

2007-2010: **Department of Supply Chain and Information Systems Smeal Chair Search Committee**.

Appointed co-chair of a committee to recruit the Smeal Chair in Supply Chain and Information Systems. Committee successfully recruited Michael Rothkopf in 2007, who passed away in 2008.

2008-2009: **Smeal Research Committee**.

Appointed member. Review and recommend Smeal faculty proposals for summer funding. Review and recommend faculty and doctoral student proposals for small grants during the academic year.

College and Department Service (cont.)

2008-2009: **Department of Supply Chain and Information Systems Candidacy Restructuring Committee**.

Appointed chair of a committee to redesign the doctoral candidacy examination. Though the issue was sensitive, the redesigned examination structure was approved unanimously by the faculty.

2008-2009: **Smeal College Strategic Plan Metrics Committee**.

Appointed position to develop departmental and college performance measures aligned with strategic plan objectives. Chair for the Dialogue with Society subcommittee, member of the Research with Impact subcommittee. New metrics developed and implemented.

2007-2008: **Smeal College Strategic Planning Council**.

Appointed position to develop key elements of the Smeal College strategic plan as part of the five-year University strategic plan development. Co-chaired the Dialogue with Society subcommittee. Key findings focused on global collaborations, research center synergies, IT enablers, and research translation to the lay media.

2007-2008: **College of Engineering Strategic Plan Task Force**.

Appointed external member of the College of Engineering New Graduate Education Programs subcommittee. Recommendations included new interdisciplinary masters programs, stronger internationalization, and new models for college-industry collaboration.

2006-2008: **Smeal College Promotion and Tenure Committee**.

Elected position, elected chair for 2007-8. Review of 2-, 4- and 6-year tenure track faculty and recommendation to the dean regarding granting tenure and promotion. As chair, assigned faculty to present details for and against each case, supervised discussion and consensus building, requested visits by department chairs to explain case details, coordinated and had final review of letters written by the committee.

2002-2006: **eBusiness Research Center Advisory Board**.

Appointed position. Advise on content and venue for research workshops and white papers, interact with industry advisory board members. Industry members provided over $500,000 annual support to the Center. Led successful search for a new executive director, recruited from industry, in 2005.

2003-2006: **Diversity Strategic Planning Committee**.

Appointed position. Worked with Assistant Dean for Diversity to develop faculty and graduate student recruiting initiatives and identify and remediate climate issues. Re-initiated faculty participation in graduate recruiting at the Chaka Fattah Conference in Philadelphia and enhanced participation in the Ph.D. Project in Chicago.

2005-2006: **Administrative Review Committee, Department of Finance**.

Appointed position to provide five-year performance review of the department chair.

2004-2005: **Research Eminence Task Force**.

Ex-officio member of committee to develop strategic initiatives to increase the research eminence of the Smeal College. Committee surveyed business school deans (35 of top 50 responded) and Smeal faculty to define dimensions of research eminence. The top five dimensions mentioned by the deans were top publications, citations, editorial board membership, research awards and Ph.D. placement. The top enabler was summer support for research. The committee recommended seeking summer support for all research active faculty and finding better ways to communicate research to its constituents.

College and Department Service (cont.)

2003-2005: **Smeal Research Database Committee**.

Ex-offico chair and creator of this committee to provide fair and visible allocation of Smeal funds for the purchase of business databases for faculty research. Collaborative effort with the University Libraries business librarian. Reduction in duplication of database purchases, and increased database availability to faculty, in part as a result of an increased share of costs borne by the library.

2002-2005: **Smeal Executive Committee**.

Ex-officio position. Advisory committee to the dean consisting of department chairs and associate deans. Focus on strategic issues related to faculty hiring, compensation and policies, educational programs, fundraising and other strategic issues.

2002-2005: **Smeal Management Committee**.

Ex-officio position. Committee for two-way communication with the dean on management issues. Consisted of the Executive Committee plus top administrators from the college, including research center directors, IT support and marketing. Discussed tactical issues involving curriculum, program deployment, marketing and public events, and accreditation.

2002-2005: **Smeal Ph.D. Student Association (SPA) Faculty Advisor**.

Founding advisor. Organization representing approximately 70 resident doctoral students. Initiated informational seminars by leading faculty, including an Editors Roundtable with Smale faculty holding top editorial positions describing how to successfully negotiate the daunting review process for academic journals. Held monthly wine and cheese faculty-student socials on campus with typical attendance of 10-15 students and 5-10 faculty.

2003-2004: **Smeal M.S. Student Association Faculty Advisor**.

Founding advisor. Encouraged joint events with SPA, and specialized events including socials and speakers on career planning and job search strategies.

2002-2003: **College of Engineering Administrative Review Committee**.

Appointed position, external member of committee to provide five-year performance review of the head of the electrical engineering department.

2000-2001: **Department of Industrial Engineering Executive Committee**.

Appointed position. Advise department head on strategic initiatives, policy and procedural issues.

1999-2001: **Department of Industrial Engineering ABET 2000 Committee Chair**.

Appointed position. Oversee significant revision in process to prepare for substantial changes in the accreditation review process, with new emphases on outcome definition, measurement and feedback for program improvement. As chair, participated in college-wide effort to coordinate approaches. Chair role transferred in 2002 upon moving to the Smeal College. Department received full accreditation in 2002.

1999-2001: **College of Engineering Sabbatical Review Committee**.

Appointed position. Sabbaticals are not guaranteed at Penn State. This committee reviewed all faculty proposals and made recommendations to the senior associate dean.

1999-2001: **Faculty Advisory and Executive Board, Leonhard Center for Engineering Education**.

Appointed position. Endowed center to host innovations in undergraduate engineering education. Center sponsored the Envisioneers, a self-managed undergraduate task force that sought out and offered curriculum improvements to engineering faculty and administrators. Appointment based in part on prior engagement with Envisioneers, and on receiving the Focus on Innovation award.

College and Department Service (cont.)

1996-2001: **Department of Industrial Engineering Promotion and Tenure Committee**.

Elected position. Chair for the 2000-2001 year. Review second, fourth and sixth year dossiers for tenure track faculty and write evaluation letter and committee recommendation for or against tenure.

1999-2000: **College of Engineering Administrative Review Committee**.

Appointed position, member of committee to provide five-year performance review of the head of the mechanical engineering department.

1999-2000: **College of Engineering Selection Committee, Premier Teaching Award**.

Appointed position as a prior award-winner. Highest College of Engineering teaching award, sponsored by the Penn State Engineering Society, the alumni association for the college.

1997-1998: **College of Engineering Faculty Council**.

Appointed and ex-officio position as a representative on Graduate Council. Advisory body to the dean.

1996-1997: **Department of Industrial Engineering Head Search Committee**.

Appointed position. Resulted in successful hiring of outside candidate.

1993-1996: **Institute of Industrial Engineers Student Chapter Co-Advisor, Advisor**.

Volunteer position. During tenure the chapter took the top two presentation awards at a regional conference at the College of New Jersey.

1992-1995: **Industrial Engineering Graduate Association**.

Volunteer position. Founding advisor. Activities modeled after Cornell graduate student association. Initiated graduate seminar and graduate social events.

Additional College and Department Service.

College of Engineering Leonhard Center Faculty Fellow, 1994-1997; Enhancement Funding Selection Committee, 1997; PSES Outstanding Teaching Award Selection Committee, 1994. Department of Industrial Engineering Undergraduate Activities Committee, 1996-1998; Computer Committee, 1991-1996; Graduate English Requirements Committee, 1994; Strategic Planning Retreat (organizer); 1993.

Professional Service

Memberships

Senior Member, IIE, Senior Member, IEEE, Member, INFORMS.

Editorial Positions

2007-present: Associate Editor, *INFORMS Journal on Computing.*

2000-present: Associate Editor, *Institute of Mathematics and its Applications Journal of Management Mathematics.*

2009-2010: Department Editor, *IIE Transactions.*

2000-2003: Associate Editor, *Naval Research Logistics.*

2000: Co-editor, *Proceedings of the 2000 Winter Simulation Conference* (252 papers, 2154 pages).

Professional Service – Editorial Positions (cont.)

1998-2000: Editor, *INFORMS College on Simulation Newsletter.*

1993-1998: Associate Editor, *Management Science.*

1994-1996: Associate Editor, *IIE Transactions.*

Professional Reviews

Manuscript reviewer: *ACM Transactions on Modeling and Simulation, ASEE Conference Proceedings, European Journal of Operations Research, IEEE Transactions on Reliability, IIE Transactions, INFORMS Journal on Computing, International Journal of Production Research, International Journal of Reliability, Quality, and Safety Engineering, Journal of Intelligent Manufacturing, Journal of Optimization Theory and Applications, Management Science, National Educators' Workshop Proceedings, Networks, Operations Research, OR Letters, SIAM Journal on Optimization, Transportation Science, Winter Simulation Conference Proceedings.*

Distinguished Service Award Committee, INFORMS Simulation Society, 2009 – present.

Selection Panel, Best Paper Award, *IIE Transactions Focus Issue on Quality and Reliability Engineering*, 2008-2009 (chair, 2009).

Outstanding Student Paper Award Committee, INFORMS QSR Section, 2003 – 2009.

Proposal Review Panel, Design, Manufacturing and Industrial Innovation Division, National Science Foundation, 1992, 1993, 1995, 1996, 1997, 2000, 2001, 2005, 2008 and peer review, 1992 – 2007.

Quality Fellowship Selection Committee, Juran Center, University of Minnesota, 2003 – 2006.

Program Review Panel, Rutgers Business School, 2005.

Dantzig Award Committee, INFORMS, 2000 – 2001.

Evaluator, Laboratoire Conception de Produits Nouveaux, ENSAM, Paris, France, December, 1999.

Selection Panel, National Defense Fellowships: Mathematics (1993), Manufacturing (1994), Materials and Manufacturing (1997).

Proposal Review, U.S. Army Research Office, 1993-1994.

Professional Organization Leadership Roles

2003-present: Advisory Board (Chair 2010), INFORMS Section on Quality, Statistics and Reliability (250 members).

2006-2008: INFORMS Simulation Society Council.

2003-2007: Program Chair, 2007 Winter Simulation Conference (329 papers, presenters from 36 countries).

2004-2006: President, INFORMS Simulation Society (550 members, former INFORMS College on Simulation).

2002-2004: Vice-President, INFORMS College on Simulation.

2000-2002: Secretary/Treasurer, INFORMS College on Simulation.

1994-1995: Design in Engineering Education Division Program Chair, ASEE National Meeting, June, 1995.

1992-1993: Design in Engineering Education Division Program Co-Chair, ASEE Centennial National Meeting, June, 1993.

1988-1989: Chair, Organizing Committee, NSF-sponsored International Workshop on Large Scale Simulation Models, Washington, D.C., 1989.

Professional Service – Editorial Positions (cont.)

Conference Committees

Track Coordinator, Analysis Methodology, Winter Simulation Conference, December 2011.

Conference Committee, IEEE International Conference on Service Operations, Logistics and Informatics, Chicago, July, 2009.

Session Organizer, INFORMS National Conference, Washington, October, 2008.

Conference Committee, St. Petersburg Workshop on Simulation, St. Petersburg, Russia, June 2001.

Session Organizer, Multivariate SPC, International INFORMS Conference, Seoul, Korea, June, 2000.

Conference Committee, European Conference on Concurrent Engineering, Erlangen, Germany, April 1999.

Session Organizer, Metamodeling, INFORMS National Conference, Seattle, October 1998.

Session Organizer, Metamodeling, Winter Simulation Conference, 1997.

Track Coordinator, Analysis Methodology, Winter Simulation Conference, December 1996.

Simulation Track Coordinator, International INFORMS Meeting, Singapore, June, 1995.

Session Organizer, International TIMS Meeting, Anchorage, June, 1994.

Session Organizer, International Simulation in Engineering Education Conference, January, 1993.

Track Coordinator, State of the Art Reviews, Winter Simulation Conference 25th Anniversary Meeting, December 1992.

Session Organizer, Annual Joint Statistical Conference (National), August, 1992.

TEACHING

New Course Development and Enhancement

2004-2005: **QMM871/872, Design Practice for Manufacturing**. Two courses redesigned and integrated to follow stage-gate process for new product development, in partnership with Kennametal (received a quality award for its new product development process) and Black and Decker, members of the QMM Industry Advisory Board. New structure remains in most recent offering.

1994-1995: **IE466, Concurrent Engineering**. New multidisciplinary course covering project management, teaming, and cross functional tools such as DFM, DFA, QFD, FMEA. Developed with the University of Washington and University of Puerto-Rico Mayagüez as part of $2.75 million ARPA Manufacturing Engineering Education Partnership, which won the NAE Gordon Prize in 2006. Course remains popular in 2010.

1993-1994: **IE 424, Process Quality Engineering**. New multidisciplinary laboratory-based course in probability and statistics. Fulfills statistics course requirement for electrical and mechanical engineers. Developed as part of $2.75 million ARPA Manufacturing Engineering Education Partnership. Also received over $180,000 in laboratory equipment and software. Course remains popular in 2010.

1991-1992: **IE578, Using Simulation Models for Engineering Design**. Multidisciplinary graduate course created in collaboration with a 10-member industry advisory board. Students exercise actual industry simulation/analysis software to develop robust product designs. using real simulation models provided by industry. Course has also been offered at Cornell, Georgia Tech and Purdue.

Courses Taught

Semester	*Course*	*Course Title*	*Enroll-ment*	*Class Hrs Per Week*	*Course Assistance*
S 94	IE 322	Intro to Probability	52	3	1TA
S 94	IE 424	Process Quality Engineering	53	3	1TA, 1RA
F 94	IE 322	Intro to Probability	56	3	1TA
F 94	IE 578	Using Sim. Models for Design	15	3	-
S 95	IE 424	Process Quality Engineering	64	3	1TA, 1RA
F 95	IE 497I	Concurrent Engineering	27	3	1RA
F 95	IE 511	Design of Experiments	18	3	-
S 96	IE 424	Process Quality Engineering	72	3	1TA
S 96	IE 578	Using Sim. Models for Design	7	3	
F 96	IE 497I	Concurrent Engineering	15	3	-
S 97	IE 424	Process Quality Engineering	70	3	1TA
S 97	IE 578	Using Sim. Models for Design	6	3	-
F 97	IE 424	Process Quality Engineering	60	3	1TA
F 97	IE 497I	Concurrent Engineering	25	3	-
S 98	IE 424	Process Quality Engineering	91	3	1TA

Teaching – Courses Taught (cont.)

Semester	*Course*	*Course Title*	*Enroll-ment*	*Class Hrs Per Week*	*Course Assistance*
F 99	IE 424	Process Quality Engineering	112	3	2TA
F 99	IE 511	Design of Experiments	25	3	.5RA
S 00	IE 424	Process Quality Engineering	96	3	1TA
F 00	IE 423	Quality Control & Reliability	84	3	1TA
F 00	IE 578	Using Sim. Models for Design	12	3	-
S 01	QMM 552	Applied SPC and Expt. Design	27	3	1TA
F 01	IE 423	Quality Control & Reliability	80	3	1TA
F 01	QMM 552	Applied SPC and Expt. Design	32	3	1TA
S 02	OISM 470W	Total Quality Management	36,22	3,3	1TA
F 02	OISM 470W	Total Quality Management	25	3	1TA
S 04	QMM 572	New Product Development	28	3	-
S 05	QMM 572	New Product Development	28	3	-
F 05	QMM 571	New Product Development	22	3	-
S 06	QMM 572	New Product Development	22	3	-
F 06	QMM 561	Manuf. Syst. Plng. and Control	27	3	1TA
S 07	SCIS 545	Supply Chain Simulation	11	3	-
F 07	QMM 561	Manuf. Syst. Plng. and Control	34	3	1TA
S 08	SCM 200	Intro. to Stat. for Business	93	4	1TA
F 08	QMM 561	Manuf. Syst. Plng. and Control	23	3	1TA
S 09	SCIS 545	Supply Chain Simulation	14	3	-
S 10	SCM 200	Intro. To Stat. For Business	90	4	1TA
Su 10	SCM 499	Supply Chain & Mfg. Mgmt. Italy	19	3	-

RESEARCH

Graduate Student Advising

Ph.D. Students

2007: Janine L. Spears: Institutionalizing Information Security Risk Management: A Multi-Method Empirical Study on the Effects of Regulation.

2004: Nirmal Govind: Robust Parameter Design with Imperfect Experimental Control of Noise (co-advised with D. J. Medeiros, Industrial Engineering).

2002: Earnest J. Foster: Multivariate Process-Oriented Statistical Process Control: A Delivery Chain Application (Co-advised with M. J. Chandra, Industrial Engineering).

2001: Martin Meckesheimer: A Framework for Metamodel-Based Design: Subsystem Metamodel Assessment and Implementation Issues (Co-advised with T. W. Simpson, Industrial Engineering).

2001: Huseyin C. Ozmutlu: Anomaly Detection in Heterogeneous Communication Networks (Co-advised with N. Gautam, Industrial Engineering).

2000: Stan G. Aungst: Applications of Multidimensional Mapping Techniques to Quality Function Deployment (Co-advised with D. T. Wilson, Marketing).

1998: Sowmya Kothandaraman: Combined Training-Scheduling Problem for Service Personnel.

1998: Burak Birgoren: Multivariate Statistical Process Control for Quality Diagnostics and Applications to Process Oriented Basis Representations.

1998: Ching-Hsin Tu: Yield Estimation by the Metamodel Method with a Boundary Focused Design.

1996: David R. González Barreto: Process-Oriented Basis Representations for Multivariate Statistical Process Control.

1995: Youngsup Joo: Information Management Model for Concurrent Engineering of Printed Circuit Board Assembly.

1995: John J. Tomick: On the Convergence of the Nelder-Mead Simplex Algorithm for Unconstrained Stochastic Optimization (Co-advised with S. F. Arnold, Statistics).

1988-2010: Advised 8 Masters theses. Membership on 21 Masters/ 21 Ph.D. committees.

Patent

1986: U.S Patent #4,630,109: Vehicle Tracking System. 46 patents reference it (to May 2010).

Funded Research and Laboratory Enhancement

Summary

PI or Co-PI for 10 NSF grants totaling approximately $1,365,000.

Three collaborative proposals had an additional $340,000 for partner schools.

PI or Co-PI for 5 industry grants totaling $225,000.

PI or Co-PI for 2 equipment grants totaling $240,000.

PI or Co-PI for 8 other grants totaling $150,000.

Research – Funded Research and Laboratory Enhancement (cont.)

Amount	Date	Sponsor	Title
5,000	6/87	CNSF	Computational tests of robust optimization algorithms (PI).
10,000	7/88	Eastman Kodak	Design of experiments for large scale simulation models (Co-PI).
3,000	5/89	U.S. Army MSI	Workshop on planning large scale simulation experiments (PI).
9,000	5/89	Cornell Theory Ctr	Workshop on planning large scale simulation experiments (PI).
5,000	9/89	CNSF	Computational tests of robust optimization algorithms (PI).
29,000	9/89	NSF	Design of experiments for large scale simulation models (PI).
10,000	11/89	Eastman Kodak	Design of experiments for large scale simulation models (PI).
30,000	9/91	NSF	New graduate course in engineering design (PI).
38,000	6/92	ARO	Yield optimization for microwave circuit simulation (PI).
1,000,000	9/92	IBM	Total quality management - responsible for $200,000 equipment and research).
34,000	6/93	ARO	Simulation metamodels for yield optimization (PI).
25,000	8/93	NSF	Using simulation models for engineering design (PI).
50,000	9/93	NASA	Multidisciplinary design (Co-PI).
66,000	3/94	State of PA	Quality lab enhancement matching funds (PI).
144,000	6/94	NSF	Process-oriented basis functions for process diagnostics (PI).
2,750,000	7/94	ARPA	Manufacturing engineering education partnership – responsible for approx. $100,000. Co-developer for 2 out of 5 new or revised courses.
4,000	9/93-4	Ford	Using simulation models for engineering design (PI).
7,000	10/96	Ctr. Food. Mfg.	DOE for food manufacturing (PI).
47,000	4/97	Fluke	Design rule project (PI).
164,000*	5/97	NSF	Process-oriented basis functions for process diagnostics (PI). *Collaborative research w/U. Puerto Rico – additional 110,000.
249,000	5/97	NSF	Metamodel-based integration strategies for system level design (PI).
25,000	9/98	NSF	Supplement for research at Ecole Centrale Paris (PI).
6,000	5/00	NSF	GOALI supplement for summer project at Boeing (PI).
50,000	9/97	Lucent	Proactive problem avoidance and QoS guarantees for large heterogeneous networks (PI).
60,000	6/00	State of PA	State equipment grant: quality lab enhancement (PI).
105,000	7/00	GM	Multivariate, graphical, and geographical approach to statistical process control (PI).
297,000	8/00	NSF	Impact of metamodel-driven visualization on design (Co-PI).
200,000*	9/00	NSF	Adjustment and monitoring methods for multiple-stream and process-oriented quality control (Co-PI). *Collaborative research w/Az. State – additional 200,000.
98,000*	9/03	NSF	A security scoring vector for web applications (Co-PI). * Collaborative Research with Polytechnic U.
98,618	9/06	NSF	Multiscale methods for supply chain monitoring (Co-PI).

HONORS AND AWARDS

2008: INFORMS Simulation Society Distinguished Service Award.

2002: American Statistical Association SPES Outstanding Presentation Award.

1998: Boeing Outstanding Engineering Educator Award, 1998.

1997: Penn State Engineering Society Premier Teaching Award.

1995: Penn State Provost's Award for Collaborative Instruction and Curricular Improvement.

1991,1995: Penn State Institute of Industrial Engineers Student Chapter Outstanding Faculty Award.

1994: Penn State Engineering Society Outstanding Teaching Award.

1994: College of Engineering Leonhard Center Focus on Innovation Award.

1985: RCA Laboratories Outstanding Achievement Award for graphical, statistical, and symmetry analyses of misconvergence and misregister data.

1983: National Finalist (one of 6) Eta Kappa Nu Outstanding Young Electrical Engineer.

PUBLICATIONS

Books and Book Chapters

1. Metamodel-based simulation optimization (with M. Meckesheimer), Chapter 18 in *Handbooks in Operations Research and Management Science: Simulation*, S. G. Henderson and B. L. Nelson, eds., New York: Elsevier Science, 2006.
2. A review of design and modeling in computer experiments (with V.C.P. Chen, K.L. Tsui, and J.K. Allen), Chapter 7 in *Handbook of Statistics 22: Statistics in Industry*, R. Khattree and C. R. Rao, eds., Amsterdam: North-Holland, 2003.
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4. *Graphical Methods for the Design of Experiments*, New York: Springer Verlag, ISBN # 0-387-94750-7, 1999.
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9. Optimal monitoring of multivariate data for fault patterns (with E. del Castillo, G. Runger and W. Woodall), *Journal of Quality Technology* 39, 159-172, 2007.
10. Graphical and text-based design interfaces for parameter design of an i-beam, desk lamp, aircraft wing, and job shop manufacturing system (with T. Simpson, M. Frecker, and L. Rothrock), *Engineering with Computers* 23, 93-107, 2007.
11. Challenges in RFID enabled supply chain management (with D. Lin H. Xu, D. Thomas, M. Freimer, J. Shu, H. Bi, and Z. Huang). *Quality Progress* 39, 23-28, 2006.
12. A Review on Design, Modeling, and Applications of Computer Experiments (with V. C. P. Chen, K.-L. Tsui and M. Meckesheimer). *IIE Transactions* 38, 273-291 (lead article), 2006.
13. Applying the proximity compatibility and the control display compatibility principles to engineering design interfaces (with L. Rothrock, K. Barron, T. W. Simpson, M. Frecker and C. Ligetti). *Human Factors and Ergonomics in Manufacturing* 16, 61-81, 2006.
14. The process-oriented multivariate capability index (with E. J. Foster, N. Gautam, L. T. Truss and J. D. Tew). *International Journal of Production Research* 43, 2135–2148, 2005.
15. Assessing the impact of graphical design interfaces on design efficiency and effectiveness (with T. Simpson, M. Frecker and G. Stump, ME, Penn State, and C. Ligetti). *ASME Journal of Computer and Information Science and Engineering* 3, 144-154, 2003.
16. The virtual integrated design method (with S. Aungst and D. T. Wilson) *Quality Engineering* 15, 565-579, 2003.
17. Computationally inexpensive metamodel assessment strategies (with M. Meckesheimer, A. Booker and T. Simpson). *AIAA Journal* 40, 2053-2060, 2002.
18. Metamodeling: radial basis functions versus polynomials (with M. F. Hussain and S. Joshi). *European Journal of Operational Research* 138, 142-154, 2002.

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20. Metamodeling of combined discrete/continuous responses (with M. Meckesheimer, T. Simpson; F. Limayem and B. Yannou). *AIAA Journal* 39, 1950-1959, 2001.
21. A one-semester laboratory-based statistics course for engineering students (with C. Nowack). *The American Statistician* 52, 233-238, 1998.
22. Design-plots for factorial and fractional factorial designs. *Journal of Quality Technology* 30, 40-54, 1998.
23. Simulated annealing heuristics for the average flow-time and the number of tardy jobs bi-criteria identical parallel machine problem (with A. Ruiz-Torres and E. E. Enscore). *Computers & Industrial Engineering* 33, 257-260, 1997.
24. Pre-experiment planning for designed experiments: graphical methods. *Journal of Quality Technology* 29, 307-316, 1997.
25. Factorial hypercube designs for spatial correlation regression (with R. Salagame). *Journal of Applied Statistics* 24, 483-503, 1997.
26. Experimental design of a two-layer electromagnetically coupled rectangular patch with a global response surface modeling technique (with P.J. Moosbrugger, Z. Lo, and L.A. Carpenter). *IEEE Transactions on Antennas and Propagation* 45, 781-787, 1997.
27. Statistical methods for management of process quality: a state of the art review (with M. J. Chandra). *International Journal of Reliability, Quality and Safety Engineering* 3, 167-183, 1996.
28. Process-oriented basis representations for multivariate process diagnostics (with D. González-Barreto). *Quality Engineering* 9, 107-118, 1996.
29. Nelder-Mead simplex modifications for simulation optimization (with J. Ivey), *Management Science* 42, 954-973, 1996.
30. Inferred advantage: using Kogan's symmetric action principle to assess alternatives in technology innovation (with G. Thomas and D. Cannon). *Research in Engineering Design* 7, 241-252, 1995.
31. A new graduate course: using simulation models for engineering design (with L. W. Schruben). *Simulation* 64, 145-153, 1995.
32. Integrated product and process design through feedback of manufacturing experience (with Y. Joo). *Computers in Industrial Engineering* 28, 561-573, 1995.
33. Graphical methods for comparing confounding in two or more designs (with L. W. Schruben). *Communications in Statistics; Simulation and Computation* 23, 953-971, 1994.
34. Implementing a relational database for an accelerated life-test facility. *IEEE Transactions on Reliability* 43, 11-21, 1994.
35. Computing forward difference derivatives in engineering optimization. *Engineering Optimization* 20, 205-224, 1992.
36. Optimal accelerated lifetest plans which minimize the maximum test stress. *IEEE Transactions on Reliability* 40, 166-172, 1991.
37. On the equivalence of transfer and generalized Benders decomposition (with D. Hearn and S. Lawphongpanich). *Transportation Research* Part B 23, 61-73, 1989.
38. Minimization algorithms for functions with random noise. *The American Journal of Mathematical and Management Sciences* 4, 109-138, 1984.
39. Defect location clustering schemes. *European Journal of Operational Research* 15, 203-211, 1984.
40. Videodisc testing at the RCA David Sarnoff Research Center (with D.P. Barton et al.). *RCA Review* 43, 228-256, 1982.
41. A 4-ghz GaAs FET power amplifier: an advanced transmitter for satellite down-link communication systems (with B. Dornan et al.). *RCA Review* 41, 472-503, 1980.
42. Evaluation of recidivism data - use of failure rate regression models (with B.W. Turnbull). *Evaluation Quarterly* 3, 629-641, 1979.

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43. A survey of covariance models for censored life data with an application to recidivism analysis (with B.W. Turnbull). *Communications in Statistics* 8, 723-750, 1979.

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44. Simulation optimization using metamodels. *Proceedings of the 2009 Winter Simulation Conference*, ed. M. D. Rossetti, R. R. Hill, B. Johansson, A. Dunkin and R. G. Ingalls. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 230-238, 2009.
45. Interdisciplinary graduate design programs: results and recommendations from a NSF workshop (with T. Simpson, S. Hunter, C. Bryant-Arnold, M. Parkinson, D. Celento and J. Messner). *Proceedings of the 2009 ASME Design Engineering Technical Conferences*, DETC2009/86699, 2009.
46. Simulation of process execution monitoring and adjustment schemes (with J. Shu). *Proceedings of the 2008 Winter Simulation Conference*, ed. S. J. Mason, R. R. Hill, L. Mönch, O. Rose, T. Jefferson and J. W. Fowler. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 1687-1693, 2008.
47. An Analysis of How ISO 17799 and SSE-CMM Relate to the S-vector Methodology (with J. Spears and W. Hery), 7th Annual ISSEA (International Systems Security Engineering Association) Conference, Ottawa, Canada, 2006.
48. A two-phase maxi-min algorithm for forward-inverse experiment design. *Proceedings of the 2006 Winter Simulation Conference*, ed. L. F. Perrone, F. P. Wieland, J. Liu, B. G. Lawson, D. M. Nicol, and R. M. Fujimoto. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 376-381, 2006.
49. Issues in development of simultaneous forward-inverse metamodels. *Proceedings of the 2005 Winter Simulation Conference*, ed. M. E. Kuhl, N. M. Steiger, F. B. Armstrong, and J. A. Joines. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 209-217, 2005.
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51. Borrowing from the Common Criteria, SSE-CMM and ISO 17799 to design a web application security assessment method (with J. L. Spears and W. J. Hery), *Proceedings of the 4th Security Conference*, Las Vegas, NV, 30-31, 2005.
52. Designing simulation experiments. In *Proceedings of the 2004 Winter Simulation Conference*, ed. R .G. Ingalls, M. D. Rossetti, J. S. Smith, and B. A. Peters. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 73-79, 2004.
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54. Variance response surface estimation for robust design: a framework for queueing systems (with N. Govind, D. Medeiros and L. Schruben). *Proceedings of the 2004 Industrial Engineering Research Conference* (IERC 2004), 2004.
55. An S-vector for Web application security management (with W. Hery and P. Liu). In *First ACM Workshop on Business Driven Security Engineering* (*BIZSEC*), Fairfax, VA, USA, 31 October 2003.
56. Towards a conceptual design explorer using metamodeling approaches and constraint programming (with B. Yannou and T. W. Simpson). *Proceedings of the 2003 ASME Design Engineering Technical Conference*, DETC2003/DAC-102, 2003.
57. Data reduction for delivery chain SPC through bundling (with E. Foster and J. Chandra). *Proceedings of the 2003 Industrial Engineering Research Conference* (IERC 2003), 2003.

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58. Panel: current issues in simulation input modeling (with R. C. H. Cheng, S. E. Chick, S. G. Henderson, A. M. Law, L. M. Leemis, B. W. Schmeiser, L. W. Schruben, and J. R. Wilson). *Proceedings of the 2002 Winter Simulation Conference*, ed. E. Yücesan, C.-H. Chen, J. L. Snowdon, and J. M. Charnes. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 353-369, 2002.
59. NCSP in design engineering: capturing performance constraints through metamodeling approaches. (with B. Yannou and T. Simpson). *Notes of the 1st International Workshop on Global Constrained Optimization and Constraint Satisfaction*, ed. C. Bliek, D. Sam-Haroud et al.,COCONUT Project (IST-2000-26063), ILOG, Valbonne, France, 2002.
60. Benefit analysis of process oriented basis representation as a method of multivariate statistical process control (with A. Schmitt). *Proceedings of the 2002 Industrial Engineering Research Conference* (IERC 2002), 2002.
61. Resampling methods for input modeling (with L. Schruben). *Proceedings of the 2001 Winter Simulation Conference*, ed. B. Peters, J. Smith, M. Rohrer, D. Medeiros. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 372-378, 2001.
62. Graphical methods for robust design of a semiconductor burn-in process (with S. Rosen, C. Geist, D. Finke, and J. Nanda. *Proceedings of the 2001 Winter Simulation Conference*, ed. B. Peters, J. Smith, M. Rohrer, D. Medeiros. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 1231-1237, 2001.
63. Designing simulation experiments. *Proceedings of the 2001 Winter Simulation Conference*, ed. B. Peters, J. Smith, M. Rohrer, D. Medeiros. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 47-52, 2001.
64. Computationally inexpensive metamodel assessment strategies (with M. Meckesheimer, T. Simpson and A. Booker). *Proceedings of the 2001 ASME Design Engineering Technical Conference*, DETC 2001/DAC 21028, 2001.
65. Experimental design issues for simultaneous fitting of forward and inverse metamodels (with M. Meckesheimer and T. Simpson). *Simulation 2001, Proceedings of the 4th St. Petersburg Workshop on Simulation.* St. Petersburg, Russia: NII St. Petersburg University Publishers, ISBN 5-7997-0304-9, 69-76, 2001.
66. Integrating design research into the classroom: an experiment in two graduate courses (with M. Frecker, T. W. Simpson, J. H. Goldberg, B. Holewinski, and G. Stump). *Proceedings of the 2001 ASEE Conference*. Session 2525, 2001.
67. Experimental design issues for simultaneous fitting of forward and inverse metamodels (with M. Meckesheimer and T. Simpson). *Proceedings of the ASME Design Engineering Technical Conferences*, DETC2000/DAC-14282, 2000.
68. Metamodeling of combined discrete/continuous responses (with M. Meckesheimer, F. Limayem and B. Yannou). *Proceedings of the ASME Design Engineering Technical Conferences*, DETC2000/DTM-14573, 2000.
69. Network monitoring: probe-subset selection using the constrained coverage problem (with H.C. Ozmutlu, N. Gautam and W.J. Hery). *Proceedings of the SPIE Conference on Performance and Control of Network Systems III*, 239-247, 1999.
70. Using metamodels for modelling the propagation of design uncertainties (with F. Limayem, M. Meckesheimer,and B. Yannou). *ICE 99: Proceedings of the 5th International Conference on Concurrent Engineering*, Nottingham, UK: Centre for Concurrent Enterprising, 521-528, 1999.
71. Process-oriented basis representations: linking manufacturing process design and diagnosis (with D. González-Barreto). *Proceedings of the 6th European Concurrent Engineering Conference*, U. Baake and R. Zobel, Eds., Society for Computer Simulation International, 109-114, 1999.
72. Simulation metamodels. *Proceedings of the 1998 Winter Simulation Conference*, ed. D. Medeiros, E. Watson, J. Carson, M. Manivannan. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 167-174, 1998.
73. Issues in combined training and dispatching decisions (with S. Kothandaraman). *Proceedings of the 1998 Industrial Engineering Research Conference* (IERC 1998), 1998.

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74. An architecture for metamodel-based design (with M. Meckesheimer). *Proceedings of the 1998 Industrial Engineering Research Conference* (IERC 1998), 1998.
75. Design of experiments for fitting subsystem metamodels. *Proceedings of the 1997 Winter Simulation Conference*, ed. S. Andradottir, K. Healy, D. Withers and B. Nelson. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 303-310, 1997.
76. Production yield estimation by the metamodel method with a boundary-focused experiment design (with C.-H. Tu) *Proceedings of the ASME Design Engineering Technical Conferences* (DETC'97), 1997.
77. Parallel machine scheduling for minimizing the makespan and the average flow-time (with A. Ruiz-Torres and E. E. Enscore). *Proceedings of the 1997 Institute of Industrial Engineers Research Conference* (IERC 1997), 186-191, 1997.
78. Feedback of manufacturing experience for DFM design rules (with Y. Joo and I. Ham). *CIRP Annals* 45, 115-120, 1996.
79. Concurrent engineering: a partnership approach (with R. Smith, C. Nowack, and J. Zayas-Castro). *ASEE Annual Conference Proceedings, American Society for Engineering Education, Washington, D.C.*, 1996.
80. Sample size selection for improved Nelder-Mead performance (with J. Tomick and S. Arnold). *Proceedings of the 1995 Winter Simulation Conference*, ed. C. Alexopolous, K. Kang, W. R. Lilegdon, and D. Goldsman. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 341-345, 1995.
81. Logistic regression for feedback of manufacturing information to design (with Y. Joo). *4th Industrial Engineering Research Conference Proceedings*, 197-204, 1995.
82. Process-oriented basis functions for multivariate diagnostics (with D. González-Barreto). *4th Industrial Engineering Research Conference Proceedings*, 954-958, 1995.
83. Formalizing the engineering change process for concurrent engineering of printed circuit board assembly: mechanisms of feeding back manufacturability experience (with Y. Joo). *Transactions of the North American Manufacturing Research Institution of SME* 22, 219-224, 1994.
84. Metamodeling: a state of the art review. *Proceedings of the 1994 Winter Simulation Conference*, ed. J.D. Tew, M.S. Manivannan, D. A. Sadowski, and A. F. Seila. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 237-244, 1994.
85. USMED: broadening the impact of simulation analysis methodology. (with L. W. Schruben, J. C. Ford, D. Hopkins, D. Goldsman, and K. J. Healy). *Proceedings of the 1994 Winter Simulation Conference*, ed. J.D. Tew, M.S. Manivannan, D. A. Sadowski, and A. F. Seila. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 1382-1386, 1994.
86. A laboratory based course in process quality engineering. *1994 Annual Conference Proceedings, American Society for Engineering Education, Washington, D.C.*, 2375-2388, 1994.
87. Uniform and bootstrap resampling of empirical distributions (with L.W. Schruben). *Proceedings of the 1993 Winter Simulation Conference*, ed. G. W. Evans, M. Mollaghasemi, E. C. Russell, and W. E. Biles. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 503-508, 1993.
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90. Ink jet printhead design: a case study in using simulation models for engineering design (with P. Ramesh). *Proceedings of the 1993 International Conference on Simulation in Engineering Education*, ed. C.E. Knadler, Jr. and H. Vakilzadian. SCS 25, 3-6, 1993.
91. Metamodels for simulation input-output relations. *Proceedings of the 1992 Winter Simulation Conference*, ed. J. Swain, D. Goldsman, R.C. Crain and J. Wilson. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 289-299, 1992.

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93. Using simulation models for engineering design. *1992 ASEE Annual Conference Proceedings*, American Society for Engineering Education, Washington, D.C., 1203-1205, 1992.
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96. Graphical techniques for the design and analysis of simulation experiments. *Proceedings of the 1989 Winter Simulation Conference* , ed. E. MacNair, K. Musselman, P. Heidelberger. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 51-61, 1989.
97. Experimental design issues for large scale simulation models (panel). *Proceedings of the 1989 Winter Simulation Conference*, ed. E. MacNair, K. Musselman, P. Heidelberger. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers, 411-418, 1989.
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111. Metamodel-based integration technology for multidisciplinary design. *Proceedings of the 2000 NSF Design and Manufacturing Grantees Conference*, 2000.
112. Process-oriented basis representations for multivariate process diagnosis and control. *Proceedings of the 1999 NSF Design and Manufacturing Grantees Conference*, 1999.
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133. SPC for supply chain data. *Industrial Engineering Graduate Seminar, Iowa State University*, September 29, 2009.
134. Forward and inverse simulation approximations for customer-driven design. *Mechanical Engineering Graduate Seminar, Iowa State University*, September 24, 2009.
135. Quality metrics and monitoring for supply chain data. *Industrial Engineering Graduate Seminar, University of Wisconsin*, October 30, 2008.
136. Monitoring methods and quality metrics for supply chain data. *Industrial Engineering Graduate Seminar, Rutgers University*, November 20, 2006, and *Lehigh University*, February 2, 2007.
137. An analysis of how ISO 17799 and SSE-CMM relate to the S-vector methodology (J. Spears, R. R. Barton and W. J. Hery). Presented by J. Spears. *International Systems Security Engineering Association 7th Annual Conference* Ottawa, Canada, May 17-19, 2006.
138. Experiment designs for forward-inverse metamodels. *Parsons Graduate Seminar, Department of Industrial and Systems Engineering, Texas A&M University*, April 3, 2006.
139. Experiment designs for forward-inverse models. *Department of Insurance, Risk and Operations Management Seminar* (*Joint with the Department of Mechanical Engineering*), *McCoombs College of Business, University of Texas*, Austin, March 31, 2006.
140. Experiment design strategies for fitting forward and inverse approximations. *Industrial Engineering and Management Sciences Seminar, Northwestern University*, January 17, 2006.
141. Issues in development of simultaneous forward-inverse metamodels. *2005 Winter Simulation Conference*, Orlando, FL, December 7, 2005.
142. Designing simulation experiments. *2004 Winter Simulation Conference*, Washington, D.C., December 6, 2004.
143. RSM Estimation for robust design of queueing systems, *Industrial Engineering Graduate Seminar, University of Florida*, November 7, 2004.
144. Designing simulation experiments. *2002 Winter Simulation Conference*, San Diego, CA, December 9, 2002.
145. Panel: current issues in simulation modeling (with J. Wilson, R. Cheng, S. Chick, S. Henderson, A. Law, L. Leemis, B. Schmeiser, L. Schruben). *2002 Winter Simulation Conference*, San Diego, CA, December 10, 2002.
146. Panel: using simulation to teach probability (with M. Rosenshine, D. Goldsman, L. Leemis, B. Nelson) *2002 Winter Simulation Conference*, San Diego, CA, December 10, 2002.
147. Experimental designs for simultaneous forward and inverse approximations (with M. Meckesheimer). *Joint Statistical Meetings*, New York, August 13, 2002. See awards section.
148. Process-oriented SPC and capability calculations. *2002 Quality and Productivity Research Conference*, Tempe, Arizona, June 6, 2002.
149. Some graphical tools for designing and analyzing experiments. *2002 Quality and Productivity Research Conference*, Tempe, Arizona, June 6, 2002.
150. Process-oriented approaches to multivariate process monitoring and adjustment. *IEEE International Conference on Systems Man and Cybernetics*, Tucson, AZ, October 2001.
151. Resampling methods for input modeling. *Industrial Engineering Graduate Seminar, University of California Berkeley*, September, 2001.

Invited Presentations (cont.)

152. Graphical methods for the design of experiments, *ASQ Philadelphia Section National Quality Month Conference, Penn State Great Valley*, October 2000.
153. Graphical methods for the design of experiments, *Industrial Engineering Graduate Seminar, Korea University*, Seoul, Korea, June 2000.
154. Issues in designing products and processes using metamodels, *Industrial Engineering Graduate Seminar, the University of Michigan*, March 2000.
155. Process-oriented basis representations for multivariate SPC, *Intel*, Tempe, AZ, March 2000.
156. Bootstrap methods for simulation output analysis, *Faculty Seminar, Southhampton University*, England, July 1999.
157. Multivariate MPS avec orientation de processus, *Renault Technocentre*, Guyancourt, France, June 1999.
158. Metamodels for engineering design, *INSEAD Graduate Seminar*, Fontainebleu, France, November 1998.
159. Bootstrap analysis of simulation output, *Faculty Seminar, Tilburg University*, Tilburg, the Netherlands, November 1998.
160. Metamodel-based architecture for system-level design, *Research Seminar, NASA Langley Research Center*, July 17, 1998.
161. A laboratory-based statistics course for engineering students, special session at the *Joint Statistical Meetings*, Anaheim, CA, August 14, 1997.
162. Key challenges for today's industrial statisticians, *Invited Moderator for Gerald Hahn at the 12th Making Statistics More Effective in Schools of Business Conference*, University Park, June 28, 1997.
163. Process-oriented pattern decomposition for multivariate SPC, *Technical Seminar, Boeing Shared Services Applied Statistics Group*, June 23, 1997.
164. Errors in simulation output analysis using empirical data, *Technical Seminar, Intel Corporation*, Tempe, AZ, April 25, 1997.
165. Feedback of manufacturing information to construct design rules via logistic regression, *Industrial Engineering Graduate Seminar, Arizona State University*, Tempe, AZ, April 25, 1997.
166. Feedback of manufacturing information to construct design rules via logistic regression, *Industrial Engineering Graduate Seminar, University of Arizona*, Tucson, AZ, April 24, 1997.
167. Selected projects in the Intelligent Design and Diagnostics Research Laboratory, *Group Presentation, Manufacturing Research Center, Wright Patterson Air Force Base*, December 16, 1996.
168. Feedback of manufacturability information to update DFM rules, *Industrial Engineering Graduate Seminar, Lehigh University*, September 27, 1996.
169. Characterizing the performance of the Nelder-Mead method for stochastic unconstrained optimization, *Research Seminar, John Hopkins Applied Physics Laboratory*, July 18, 1996.
170. Bootstrap methods for estimating errors from empirical distributions in simulation, *Industrial Engineering Graduate Seminar, Rutgers University*, October 2, 1995.
171. Metamodeling: a state of the art review, and USMED: broadening the impact of simulation analysis methodology, *State of the Art Review talk for the 1994 Winter Simulation Conference*, December 10, 1994.
172. Using empirical distributions in simulation, *Fall 1993 ORSA/TIMS National Meeting*, Phoenix, AZ, November 2, 1993.
173. Using empirical distributions in simulation, *SIAM Conference on Simulation and Monte Carlo Methods*, San Francisco, CA, August 6, 1993.
174. Metamodels for simulation input-output relations, *Advanced Tutorial for the 1992 Winter Simulation Conference*, Crystal City, VA, December 15, 1992.
175. Simulation metamodels, *Fall 1992 ORSA/TIMS Joint National Meeting*, San Francisco, CA , November 2, 1992.
176. Relating yield maximization and Taguchi robust design through Chebychev's inequality, *Operations Research Graduate Seminar, Cornell University*, September 9, 1992.

Invited Presentations (cont.)

177. Using simulation models for engineering design, *CAD-STAR Review for the Department of Defense*, Crystal City, VA, October 10, 1991.
178. Operations research models in an industrial research center, Invited member, *People to People Operations Research Delegation to the People's Republic of China* (chair: A. Blumstein), July 1984.