

INDUSTRIAL AND SYSTEMS ENGINEERING



REPORT OF **Research and Scholarly Activities**

Academic Years 2006 – 2007



AUBURN
UNIVERSITY

Report of Research and Scholarly Activities

Academic Years 2006 – 2007

TABLE OF CONTENTS

1 DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING

2 FACULTY BACKGROUND, AFFILIATIONS AND HONORS

J T. Black, Professor Emeritus, Ph.D., P.E.
Robert “Bob” L. Bulfin, Technology Management Professor, Ph.D.
Gerard “Jerry” A. Davis, Assistant Professor, Ph.D., C.P.E., C.S.P.
John L. Evans, Associate Professor, Ph.D.
Kevin R. Gue, Associate Professor, Ph.D.
Emmett J. Lodree, Assistant Professor, Ph.D.
Saeed Maghsoodloo, Professor, Ph.D., P.E.
Chan S. Park, Ginn Distinguished Professor, Ph.D., P.E.
Lewis N. Payton, Assistant Research Professor, Ph.D.
Lu Ann Sims, Instructor and Academic Advisor, M.S.
Alice E. Smith, Professor And Chair, Ph.D., P.E.
Jeffrey “Jeff” S. Smith, Professor, Ph.D.
Robert “Rob” E. Thomas, Professor, Ph.D., P.E., C.P.E.
Jorge F. Valenzuela, Associate Professor, Ph.D.

8 ARCHIVAL SCHOLARLY PUBLICATIONS

BOOK AND BOOK CHAPTERS

JOURNAL ARTICLES

SPONSORED RESEARCH PROJECTS

ACIPCO
Auburn University
Diversified Systems
Extreme Environment Electronics
Gul Technologies
Henkel Electronics
KCE American Inc.
Kemet Inc.
Mack-Blackwell Transportation Center
Nanya Corporation
National Aeronautics and Space Administration (NASA)
National Institute for Occupational Safety and Health (NIOSH)
National Science Foundation (NSF)
National Space Science and Technology Center (NSSTC)
Rockwell Automation
Office of Naval Research
Siemens
Southern Consortium for Injury Biomechanics
United States Department of Agriculture (USDA)

15 GRADUATE STUDENT DEGREES

Ph.D. Dissertations
M.S. Theses
M.I.S.E. Projects

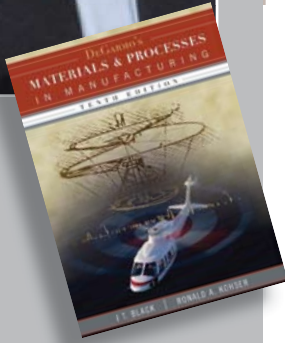
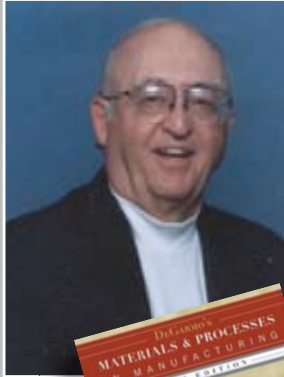
DEPARTMENT OF
INDUSTRIAL AND SYSTEMS ENGINEERING
Samuel Ginn College of Engineering

- Granting degrees since 1931
- Ranked in top 25 percent of programs by latest U.S. News & World Report
- 14 faculty members, 260 students
- Four degrees – B.I.S.E., M.I.S.E., M.S. and Ph.D.
- Dual degree – M.B.A./M.I.S.E. program
- Outreach via DVD available for all graduate degrees
- More than 4,000 living alumni
- Course work in information technologies, simulation, quality control, lean manufacturing, operations research, manufacturing processes, electronics manufacturing, financial engineering, logistics and scheduling, reliability, probability and statistics, decision analysis, human factors, ergonomics, industrial hygiene, and safety
- More than \$1 million in annual research expenditures with sponsorship from National Science Foundation, Center for Disease Control/National Institute of Occupational Safety and Health, U.S. Navy, U.S. Department of Agriculture, NASA and many corporations
- High achieving alumni including current or past:
 - CEO, Accenture
 - CEO, Gulf Power
 - CEO, Southern Nuclear
 - CEO, Pacific Bell
 - President, Honeywell Sensing and Control
 - CFO, Mirant
 - COO, Apple Computer
 - VP and CIO, Verizon
 - VP, Northrup Grumman
 - Director, U. S. Army Aviation and Missile Command
 - Director of Safety, Johnson & Johnson

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FACULTY BACKGROUND, AFFILIATIONS AND HONORS

J T. Black, Professor Emeritus, P.E.



Ph.D., University of Illinois-Urbana, 1969

Research in materials processing/metal cutting theory and practice; manufacturing systems design and engineering; and linked-cell manufacturing systems

- Accreditation Board Engineering Technology (ABET): Reviewer for *Manufacturing Education*
- Alpha Pi Mu (Industrial Engineering Honor Society)
- American Society of Mechanical Engineers (ASME): Fellow
- Institute of Industrial Engineers (IIE): Fellow
- Sigma Xi, National Research Honor Society: Member
- Society for Integrated Manufacturing: Member
- Society of Manufacturing Engineers (SME): CASA Member and Fellow
- SME: Member of the Educational Foundation Board of Directors
- North American Manufacturing Research Institute of SME: Member
- Texas Higher Education Board: Reviewer for Proposals and Programs

Robert "Bob" L. Bulfin, Technology Management Professor



Ph.D., Georgia Institute of Technology, 1975

Research in developing solution techniques which can be applied to problems in the real world – defining problems, developing models, and determining solution procedures for these models; specific applications include allocating funds in copper production, determining the best use of safety funds, and scheduling in a variety of situations

- Alpha Pi Mu (Industrial Engineering Honor Society)
- Institute of Industrial Engineers (IIE): Senior Member
- Institute for Operations Research and Management Science (INFORMS): Member

Gerard “Jerry” A. Davis, Assistant Professor, C.P.E., C.S.P.



Ph.D., Auburn University, 2001

Research in occupational safety and ergonomics; manpower, staffing and productivity issues associated with the labor force

- Institute of Industrial Engineers (IIE): Senior Member
- IIE: Society for Work Science(SWS): President 2005-2006, Past-president, 2006-2007
- American Society of Safety Engineers (ASSE): Professional member
- ASSE, Academics Practice Specialty: Member
- ASSE, Engineering Practice Specialty: Member
- Board of Certified Professional Ergonomics (CPE): Member
- Board of Certified Safety Professionals (CSP): Member
- Human Factors and Ergonomics Society (HFES), Education Technical Group (ETG): Member
- HFES, Safety Technical Group (STG): Member

John L. Evans, Associate Professor



Ph.D., University of Alabama, Huntsville, 1991

Research in investigating next generation electronics packaging and manufacturing technologies needed for the advancement of the electronics industry and developing an automotive engineering education program for the expanding southeastern U.S. manufacturing base

- NSF's Center for Advanced Vehicle Electronics (CAVE): Associate Director
- Surface Mount Technology Association (SMTA): Senior Member
- SMTA, Technical Committee, 2001 to Present: Member
- SMTA/CAVE: Conference Chair, Harsh Environment Electronics Conference, Indianapolis, July 2006
- SMTA, SMTA International, Harsh Environment Sessions, Chicago, September 2006: Track Chairmen
- Institute of Electrical and Electronics Engineers (IEEE): Member
- Institute of Industrial Engineers: Member
- Society of Automotive Engineers (SAE): Member

Kevin R. Gue, Associate Professor



Ph.D., Georgia Institute of Technology, 1995

Research in logistics modeling and optimization, including distribution, transportation, warehousing and material handling

- Second Place, 2006 Outstanding Material Handling Research Paper Award, Material Handling Industry of America, for "The Best Shape for a Crossdock," with John Bartholdi, III
- Material Handling Case Student Competition Team, national first place winners, 2006: Faculty Advisor
- College-Industry Council on Material Handling Education: President
- Transportation Science and Logistics Society, Facility Logistics Special Interest Group: Vice Chair
- Institute of Industrial Engineers (IIE): Senior Member
- Special issue of *IIE Transactions* on facility logistics: Co-Editor
- Institute for Operations Research and Management Science (INFORMS): Member

Emmett J. Lodree, Assistant Professor



Ph.D., University of Missouri-Columbia, 2001

Research in operations research, production and inventory control theory, reliability and maintenance, scheduling theory and transportation logistics

- Institute for Operations Research and Management Science (INFORMS): Member
- Institute of Industrial Engineers (IIE): Member
- American Society for Engineering Education (ASEE): Professional Member

Saeed Maghsoodloo, Professor, P.E.



Ph.D., Auburn University, 1968

Research in statistical quality control, Taguchi methods and multivariate analysis

- Institute of Industrial Engineers (IIE): Member
- IIE, Editorial Board of Quality and Reliability Engineering: Member
- *IIE Transactions*: Associate Editor
- *Journal of Manufacturing Systems*: Associate Editor
- American Society for Quality Control (ASQC): Member

Chan S. Park, Ginn Distinguished Professor, P.E.



Ph.D., Georgia Institute of Technology, 1977

Research in pricing transmission congestions (power economics and energy modeling), real options (strategic investment decisions under uncertainty) and financial engineering

- Institute of Industrial Engineers (IIE): Fellow
- IIE, The Wellington Award Committee, Engineering Economy Division: Chair
- Institute of Electrical and Electronics Engineers (IEEE): Member
- National Science Foundation (NSF): Panel Reviews
- *The Engineering Economist*: Editor Emeritus

Lewis N. Payton, Assistant Research Professor



Ph.D., Auburn University, 2002

Research in DFMA (Design for Manufacture and Assembly), Toyota production controls, friction stir welding, lead free solders, deformation of materials, tribology, metal cutting theory, casting, advanced manufacturing methods, biomechanics and ergonomics, biomechanics and the aging work force

- Alpha Pi Mu (Industrial Engineering Honor Society): Member
- American Society for Engineering Education (ASEE): Member
- American Society of Safety Engineers (ASSE): Member

- Human Factors and Ergonomics Society (HFES): Member
- Institute of Industrial Engineers (IIE): Member
- Sigma Pi Sigma (National Physics Honorary Society): Member
- Society of Manufacturing Engineers (SME): Member
- The Materials Society: Member
- The Welding Society: Member

Lu Ann Sims, Instructor and Academic Advisor



M.S., Georgia Institute of Technology, 1978

Engineering education and computer methods in engineering

- ABET reviewer for industrial engineering programs
- Institute of Industrial Engineers (IIE): Senior Member and Chapter Advisor (2005)

Alice E. Smith, Professor and Chair, P.E.



Ph.D., University of Missouri – Rolla, 1991

Research in the modeling and optimization of complex systems with emphasis on methods inspired by nature

- E.L. Grant Award for the Best Paper published in *The Engineering Economist*, Volume 50, 2006
- American Society for Engineering Education (ASEE): Member
- ASEE: Zone II, Best Paper Award
- *Computers and Operations Research*: Associate Editor
- *International Journal of General Systems* (Taylor and Francis): Editorial Board
- Institute of Electrical and Electronics Engineers (IEEE): Senior Member
- *IEEE Transactions on Evolutionary Computation*: Associate Editor
- Institute of Industrial Engineers (IIE): Fellow
- *IIE Transactions*: Design and Manufacturing Editorial Board
- Institute for Operations Research and Management Science (INFORMS): Member
- *INFORMS Journal on Computing*: Associate Editor
- Congress on Evolutionary Computation (CEC200) 2006: Program Committee

- Ninth International Conference on Parallel Problem Solving from Nature (PPSN VIII) 2006, Reykjavik: Program Committee
- Society of Women Engineers (SWE): Senior Member

Jeffrey “Jeff” S. Smith, Professor



Ph.D., Penn State University, 1992

Research in discrete event simulation and manufacturing systems design and analysis

- Institute of Industrial Engineers (IIE): Senior Member
- Institute for Operations Research and Management Science (INFORMS): Member
- National Science and Engineering Research Council (Canada): Written Reviews

Robert “Rob” E. Thomas, Professor, P.E., C.P.E.



Ph.D., Texas A & M University, 1988

Research in general occupational safety and ergonomics, occupational biomechanics, human factors engineering, workplace and work area design

- American Industrial Hygiene Association, Ergonomics Committee: Special Steering Group
- Alabama Academy of Science (AAS): Member
- American Industrial Hygiene Association (AIHA): Senior Member
- American Society for Engineering Education (ASEE): Member
- American Society of Safety Engineers (ASSE): Member
- Institute of Industrial Engineers (IIE): Senior Member
- Human Factors and Ergonomics Society (HFES): Member

Jorge F. Valenzuela, Associate Professor



Ph.D., University of Pittsburgh, 2000

Research in stochastic modeling and optimization, both theory and applications; research involves stochastic models for the evaluation of production costs and optimization of electric power generation

- William Walker Teaching Award, Samuel Ginn College of Engineering
- Institute for Operations Research and Management Science (INFORMS), Section on Energy, Natural Resources, and the Environment: Chair
- Institute of Electronic and Electrical Engineers (IEEE) : Member
- Institute of Industrial Engineers (IIE) : Member
- INFORMS: Member
- National Science Foundation (NSF): Panel Member



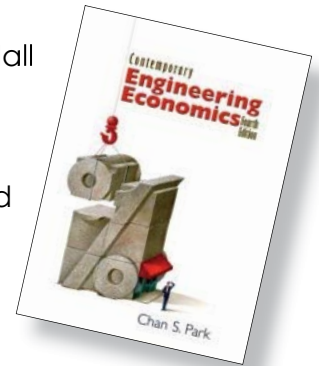
ARCHIVAL SCHOLARLY PUBLICATIONS

Book and Book Chapters

Emmett J. Lodree and B.A. Norman, "Scheduling Models for Optimizing Human Performance and Well Being, Production Scheduling Handbook", (*International Series in Operations Research and Management Science*). Edited by Jeffrey Hermann, 2006, Springer, pages 287-313.

Chan S. Park, *Contemporary Engineering Economics*, 4E, 2006, Prentice Hall (900 pages).

Abdullah Konak and **Alice E. Smith**, "Network Reliability Optimization," *Handbook of Optimization in Telecommunications* (M. G. C. Resende and P. Pardalos, editors), Springer Verlag, USA, 2006, Chapter 26, 735-760.



Journal Articles

J T. Black, "Design Rules for Implementing the Toyota Production System," *International Journal of Production Research*, 45(16): 3639-3664 (2007).

L.R. Wade and **Gerard A. Davis**, "Transitioning Sloped Surfaces: The Effects of Roofing Work on Balance and Falls," *Journal of the American Society of Safety Engineers*, 50(9): 45-50 (2005).

L.R. Wade, **Gerard A. Davis**, T.S. Marzilli and W.H. Weimar, "Information Processing Capacity While Wearing Personal Protective Eyewear," *Ergonomics*, 49(10): 955-967 (2006).

John L. Evans, Jared A. Davis, Elliott Crain and James R. Thompson, "Component Reliability of Metal-Backed Substrates for Harsh Automotive Environments," *Journal of Surface Mount Technology*, 17(4): 24-33 (2004).

John L. Evans, D. Zhang, N. Vogt and J.R. Thompson, "Investment Analysis for Automotive Electronics Manufacturing: A Case Study," *The Engineering Economist*, 49(2): 159-182 (2004).

J.C. Suhling, P. Lall, M. Bozack, **John L. Evans** and R.W. Johnson, "Thermal Cycle Reliability of Lead Free Chip Resistor Solder Joints," *Journal of Soldering and Surface Mount Technology*, 16(2): 77-87 (2004).

R.W. Johnson, **John L. Evans**, J.R. Thompson and P. Jacobsen, "The Changing Automotive Environment: High Temperature Electronics," *IEEE Transactions Journal of Electronics Manufacturing Packaging*, 27(3): 164-176 (2004).

P. Lall, M. Islam, **John L. Evans**, J. Suhling and T. Shete, "Damage Mechanics of Electronics on Metal-Backed Substrates in Harsh Environments", *IEEE Transactions on Components and Packaging Technologies*, 29(1): 204-212 (2006)

Bold type denotes faculty of the Department of Industrial and Systems Engineering at Auburn University

Kevin R. Gue, Russell D. Meller and Joseph D. Skufca, "The Effects of Pick Density on Order Picking With Narrow Aisles," *IIE Transactions*, 38: 859-868 (2006).

Kevin R. Gue, "Very High Density Storage Systems," *IIE Transactions*, 38: 93-104 (2006).

Emmett J. Lodree, "Advanced Supply Chain Planning With Mixtures of Backorders, Lost Sales, and Lost Contract," *European Journal of Operational Research*, 181: 168-183, (2007).

Emmett J. Lodree, "EOQ Revisited: The Case of Unequal and Integral Order Quantities," *International Journal of Production Economics*, 105: 580-590 (2007).

Fazel Hayati, **Saeed Maghsoodloo**, Michael J. DeVivo and **Brian J. Carnahan**, "Control Chart for Monitoring Occupational Asthma," *Journal of Safety Research*, 37(1): 17-26 (2006).

David A. Umphress, Dean Hendrix, James H. Cross II and **Saeed Maghsoodloo**. "Software Visualization for Improving and Measuring the Comprehensibility of Source Code," *Journal of Science of Computer Programming*, 60: 121-133 (2006).

Lewis N. Payton, "Design for Manufacturing Excellence (DFMX) Begins at the Freshman Level", *Journal of Manufacturing Processes*, 24(3): 178-185 (2006).

Bryan A. Norman and **Alice E. Smith**, "A Continuous Approach to Considering Uncertainty in Facility Design," *Computers and Operations Research*, 33 (6): 1760-1775 (2006).

Orhan Dengiz, **Alice E. Smith** and Ian Nettleship, "Grain Boundary Detection in Microstructure Images Using Computational Intelligence," *Computers and Industry*, special issue on machine vision, 56(8-9): 854-866 (2005).

Ravipim Chaveesuk and **Alice E. Smith**, "Dual Kriging: An Exploratory Use in Economic Metamodeling," *The Engineering Economist*, 50(3): 247-271 (2005).

Orhan Dengiz, Tiandan Chen, Ian Nettleship and **Alice E. Smith**, "The Effect of Powder Forming Method on the Pull-Out Flaw Populations Observed on Polished Surfaces of Alumina Ceramics," *Materials Science and Engineering*, A427: 160-166 (2006).

Orhan Dengiz, **Alice E. Smith** and Ian Nettleship, "Two Stage Data Mining for Flaw Identification in Ceramics Manufacture," *International Journal of Production Research*, special issue on data mining, 44(15): 2839-2851 (2006).

Abdullah Konak, Sadan Kulturel Konak, Bryan A. Norman and **Alice E. Smith**, "A New Mixed Integer Programming Formulation For Facility Layout Design Using Flexible Bays," *Operations Research Letters*, 34(6): 660-672 (2006).

Abdullah Konak, David W. Coit and **Alice E. Smith**, "Multi-Objective Genetic Algorithms: A Tutorial," *Reliability Engineering and Systems Safety*, 91: 992-1007 (2006).

Sadan Kulturel-Konak, **Alice E. Smith** and Bryan A. Norman, "Multi-Objective Tabu Search Using a Multinomial Probability Mass Function," *European Journal of Operational Research*, 169: 918-931 (2006).

Bold type denotes faculty of the Department of Industrial and Systems Engineering at Auburn University

Yun-Chia Liang and **Alice E. Smith**, "An Ant Colony Approach to the Orienteering Problem," *Journal of Chinese Institute of Industrial Engineers*, 23(5): 404-414 (2006).

S.R. Gupta and **Jeffrey S. Smith**, "Algorithms for Single Machine Total Tardiness Scheduling with Sequence Dependent Setups," *European Journal of Operational Research*, 175: 722-739 (2006).

Robert E. Thomas and **Gerard A. Davis**, "Earning a Ph.D. from Engineering-Based Safety and Ergonomics Program: The Case for a Flexible Campus Based Program," *Journal of Safety, Health and Environmental Research (JSHER)*, 2(2): Feature (4) (2005).

T. Kaewthummanukul, K. Brown, D. Grimley, M. Hill, M. Weaver and **Robert E. Thomas**, "Predictors of Exercise Participation Among Thai Female Hospital Nurses," *Journal of Advanced Nursing*, 54: 663-675 (2006).

G. Holman, **Brian Carnahan** and **Robert E. Thomas**, "Using Surveys to Identify Stressors in Generalized Jobs: A Direct Clustering Method," *International Journal of Industrial Ergonomics*, 36: 671-677 (2006).

L. Wang, M. Mazumdar, M. Bailey, and **Jorge Valenzuela**, "Oligopoly Models for Market Price of Electricity under Demand Uncertainty and Unit Reliability," *European Journal of Operations Research*, Vol. 181: 1309-1321 (2007).

Jorge Valenzuela, G. Ramasamy, and H. Ramaswamy, "A Feeder Replenishment Policy for a Turret-Head Placement Machine," *International Journal of Production Research*, Vol. 45, No. 8: 1861-1879 (2007).

Kaymaz P., **Jorge Valenzuela** and **Chan Park**, "Transmission Congestion and Competition in Power Generation Expansion," *IEEE Transactions on Power Systems*, Vol. 22: 156-163 (2007).

Jorge Valenzuela and M. Mazumdar, "Cournot Prices Considering Generator Availability and Demand Uncertainty," *IEEE Transactions on Power Systems*, Vol. 22: 116-125 (2007).

Ramasamy, G. and **Jorge Valenzuela**, "A 2-OPT Procedure to Reduce Total Inspection Time in a Serial Inspection Process," *Journal of Flexible Service and Manufacturing*, Vol. 18, No. 2: 99-119 (2006).

Sisworahardjo, S., A. El-Keib, **Jorge Valenzuela**, R. Brooks, J. Choi, and I. El-Ajtal, "A Stochastic Electricity Load Model," *Electric Power Systems Research*, Vol. 76: 500-508 (2006).

Jorge Valenzuela and M. Mazumdar, "A Probability Model for the Electricity Price Duration Curve under an Oligopoly Market," *IEEE Transactions on Power Systems*, Vol. 20, No. 3: 1250-1256 (2005).

Jorge Valenzuela, "An Analytical Approximation to the Probability Distribution of Electricity Marginal Production Costs," *Journal of Energy Engineering*, Vol. 131, No. 2: 157-171 (2005).

Jorge Valenzuela, J., H. Balci, and T. McDonald, "A Transportation-Scheduling System for Managing Silvicultural Projects," *International Journal of Forest Engineering*, Vol. 16, No. 1: 65-75 (2005).

Bold type denotes faculty of the Department of Industrial and Systems Engineering at Auburn University

SPONSORED RESEARCH PROJECTS

ACIPCO

Lewis N. Payton, "Material Indices of Grey Ductile Iron," (\$20,000). Funded through the Solidification Center.

Auburn University

Emmett J. Lodree, "A Mathematical Modeling Approach to the Logistics of Disaster Planning and Response," Auburn University Title VI Program sponsored by the Office of the Provost (\$18,607).

Diversified Systems

John L. Evans, "Evaluation of Ployclad Materials for Harsh Environments," (\$6,500).

Extreme Environment Electronics

John L. Evans, "Reliability Testing of Lead-Free BGAs," (\$50,000).

Gul Technologies

John L. Evans, "Harsh Environment Qualification of Printed Circuit Board," (\$6,500).

Henkel Electronics

John L. Evans, "Molding Materials Evaluation for Mechatronic Controllers. Evaluation of High Temperature Molding Materials for Harsh Environment Applications," (\$25,000).

KCE American Inc.

John L. Evans, "TLM Printed Circuit Board Material Evaluation," (\$7,500).

Kemet Inc.

John L. Evans, "Testing Methods for Capacitor Cracking in Harsh Environments," (\$75,000).

Mack-Blackwell Transportation Center

Kevin Gue, "A Nationwide Maglev Train Network for Very High-Speed Freight Distribution," University of Arkansas, \$100,000 (\$20,000 to AU), Co-PI Russell D. Meller.

Nanya Corporation

John L. Evans, "ImSn Plating for Printed Circuit Boards" (\$9,500).

National Aeronautics and Space Administration (NASA)

Alice E. Smith and **Jeffrey S. Smith**, "Academy of Aerospace Quality," International Space Station Program, Johnson Space Center (\$330,000).

Alice E. Smith, "Academy of Aerospace Quality – Phase II," with **Jeffrey S. Smith**, International Space Station Program, Johnson Space Center, (\$462,090).

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National Institute for Occupational Safety and Health (NIOSH)

Robert E. Thomas (PI) and **Gerard A. Davis**, NIOSH ERC Training Grant T42/OH00843436-02; "Occupational Safety and Ergonomics Program," (\$172,901).

Robert E. Thomas (PI) and **Gerard A. Davis**, NIOSH ERC Training Grant T42/OH00843436-02; "Occupational Injury Prevention Research Training," (\$121,668).

Robert E. Thomas (PI) and **Gerard A. Davis**, NIOSH ERC Training Grant T42/OH008436-03; "Occupational Safety and Ergonomics Program," (\$199,489).

Robert E. Thomas and **Gerard A. Davis** (PI), NIOSH ERC Training Grant T42/OH008436-03; "Occupational Injury Prevention Research Training," (\$98,257).

National Science Foundation (NSF)

Robert L. Bulfin, "US-Tunisia Cooperative Research: Scheduling with Due Dates" (\$30,580).

J.C. Suhling, **John L. Evans**, P. Lall, G. Flowers, M. Bozack, "Center for Advanced Vehicle Electronics (CAVE), 5 Year Renewal," National Science Foundation I/UCRC - NSF (\$215,000) - National Science Foundation – Estimated Industry Funding (\$4,000,000).

John L. Evans, "Accelerated Life Testing for Harsh Environment Electronics," National Science Foundation CAVE (\$100,000).

John L. Evans, "Reliability Testing of Leadless and Small Grid Array Packages," National Science Foundation CAVE (\$50,000).

John L. Evans, "Harsh Environment Testing for Integrated Electronics – Phase II," NSF's Center for Advanced Vehicle Electronics (CAVE) (\$225,000).

Kevin Gue, "Designing Distribution Centers for the Service Economy," National Science Foundation, (\$400,000) (approx \$170,000 to Auburn), Co-PI: Russell D. Meller (Univ. Arkansas).



Tennis umpire software developed by **Jeff Smith** and master's graduate **Adam Farmer** has been used at the past two U.S. Open Tennis Tournaments.

Bold type denotes faculty of the Department of Industrial and Systems Engineering at Auburn University

Chan S. Park, "Pricing Transmission Congestion to Alleviate System Stability Constraints in Bulk Power Planning," (\$363,000), with Mark Halpin and **Jorge Valenzuela**.

Alice E. Smith, "Planning Visit: Workshop on Industrial Engineering Women in Academia," #OISE-0549304, (\$14,705).

Alice E. Smith, "Industry/University Cooperative Research Center for Advanced Vehicle Electronics (CAVE), Research Experiences for Teachers," with Jeff Suhling (Mechanical Engineering, Auburn University), (NSF), Supplement to #EEC-9907749, (\$20,000).

Alice E. Smith, "Next Generation of Manufacturing Engineers for the Automotive Sector," with **John L. Evans** and Peter Jones (Mechanical Engineering), #DUE-0422361, (\$400,000).

Jeffrey S. Smith, L.D. Benefield, R. W. McCord, and P.K. Raju, "Initiating and Sustaining Industrial Renaissance Through Innovative Partnerships," (\$600,000).

Jorge Valenzuela, "GOALI: Collaborative Research – A Systems Approach to Modeling Real-Time Market Prices of Electricity," (\$280,000), Co-PI Mainak Mazumdar, University of Pittsburgh.

Jorge Valenzuela, "Research Experiences for Undergraduates Site in Automotive Manufacturing System," with **Jerry Davis**, NSF, (\$245,000).

National Space Science and Technology Center (NSSTC)

Lewis N. Payton, "National Space Science and Technology Center. Metal Cutting Theory and Friction Stir Welding/Forming Initiatives at Auburn University for General Industry and Space Propulsion," (\$66,929).

Rockwell Automation

Jeffrey S. Smith, "Simulation-based Commissioning of Factory Control Systems," (\$22,364).

Office of Naval Research

Kevin Gue, "Very High Density Storage Systems," (\$135,000).

Siemens

John L. Evans, "Printed Circuit Board Testing for Harsh Environment Applications," (\$75,000).

Jeffrey S. Smith, "Simulation of an AS/RS and AGV System," (\$16,000).

Jeffrey S. Smith, "Simulation of Electronics Assembly Lines," (\$21,000).

Southern Consortium for Injury Biomechanics

Lewis N. Payton, "Evolutionary Design of Finite Element Meshes for Injury Biomechanics Research," UAB/FHWA, (\$100,000).

United States Department of Agriculture (USDA)

Jeffrey S. Smith, and **Alice E. Smith**, "Simulation-based Security System Analysis for Food Processing/Water Treatment Facilities," through the "RFID Bacteria Sensor Tags" Center, Bryan Chin, PI, (\$55,000).

Bold type denotes faculty of the Department of Industrial and Systems Engineering at Auburn University



Dr. Maghsoodloo with doctoral graduates Victoria Jordan (now at Vanderbilt University Hospitals) and Gultekin Ozdemir (now at Suleyman Demirel University in Turkey).

GRADUATE STUDENT DEGREES

Ph.D. (Dissertations)

Jessie Godbey, "The Effects of Behavior-Based Safety Techniques on Behavior Variation, Targeted and Non-Targeted Safe Behaviors, and Productivity and Quality in Manufacturing Facilities," Advisor, **Robert E. Thomas**.

Victoria Jordan, "The Optimum Upper Screening Limit and Optimum Mean Fill Level to Maximize Expected Net Profit in the Canning Problem for Finite Continuous Distributions," Advisor, **Saeed Maghsoodloo**.

Sevin Sozer, "Transmission Expansion Planning to Alleviate Congestion in Deregulated Power Markets," Advisor, **Chan S. Park**.

Yang Yangchun, "Knapsack Problems with Setup," Advisor, **Robert L. Bulfin**.

Pinar Kaymaz, "Electric Power Generation Expansion in Deregulated Markets," Advisor, **Jorge Valenzuela**.

M.S. (Theses)

Claudia Escobar, "Sensitivity Analysis of Subjective Ergonomic Assessment Tools," Advisor, **Jerry Davis**.

Harish-Krishna Ramaswamy, "A Feeder Allocation Policy for a Turret Head Placement Machine Using Dynamic Programming," Advisor, **Jorge Valenzuela**.

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Charles Mitchell, "PBGA Reliability of Lead Free Solder Balls with Tin Lead Solder Paste for Harsh Environment Electronics." Advisor, **John L. Evans**.

Abishek, Ramesh, "Bottleneck Detection and Mitigation in Serial Production Systems," Advisor, **Jeffrey S. Smith**.

M.I.S.E. (Projects)

Shaman Ahuja, "Energy Control Program (Lockout/Tagout) Audit," Advisor, **Jerry Davis**.

Mohammed Ben Jazia, "Scheduling Production Using Linear Programming and Neural Networks," Advisor, **Jorge Valenzuela**.

Kelly Combs, "Job Hazard Analysis: Supervisor Training," Advisor, **Jerry Davis**.

Deepesh Desai, "Development and Validation of an Ergonomic Job Rotation Schedule at a Manufacturing Facility," Advisor, **Jerry Davis**.

Cheng Hao Feng, "Design of a Student Course Schedule Optimizer," Advisor, **Robert L. Bulfin**.



Adityay, Konduru, "Real Options Approach to Evaluate a Multi Phase Project of a Telecom Firm," Advisor, **Chan S. Park**.

Taylor Lightfoot, "A Safety Review of a First Tier Automotive Supplier," Advisor, **Lewis N. Payton**.

Andrew Phelps, "A Safety Review and Ergonomic Job Rotation of an Automotive Manufacturer," Advisor, **John L. Evans**.

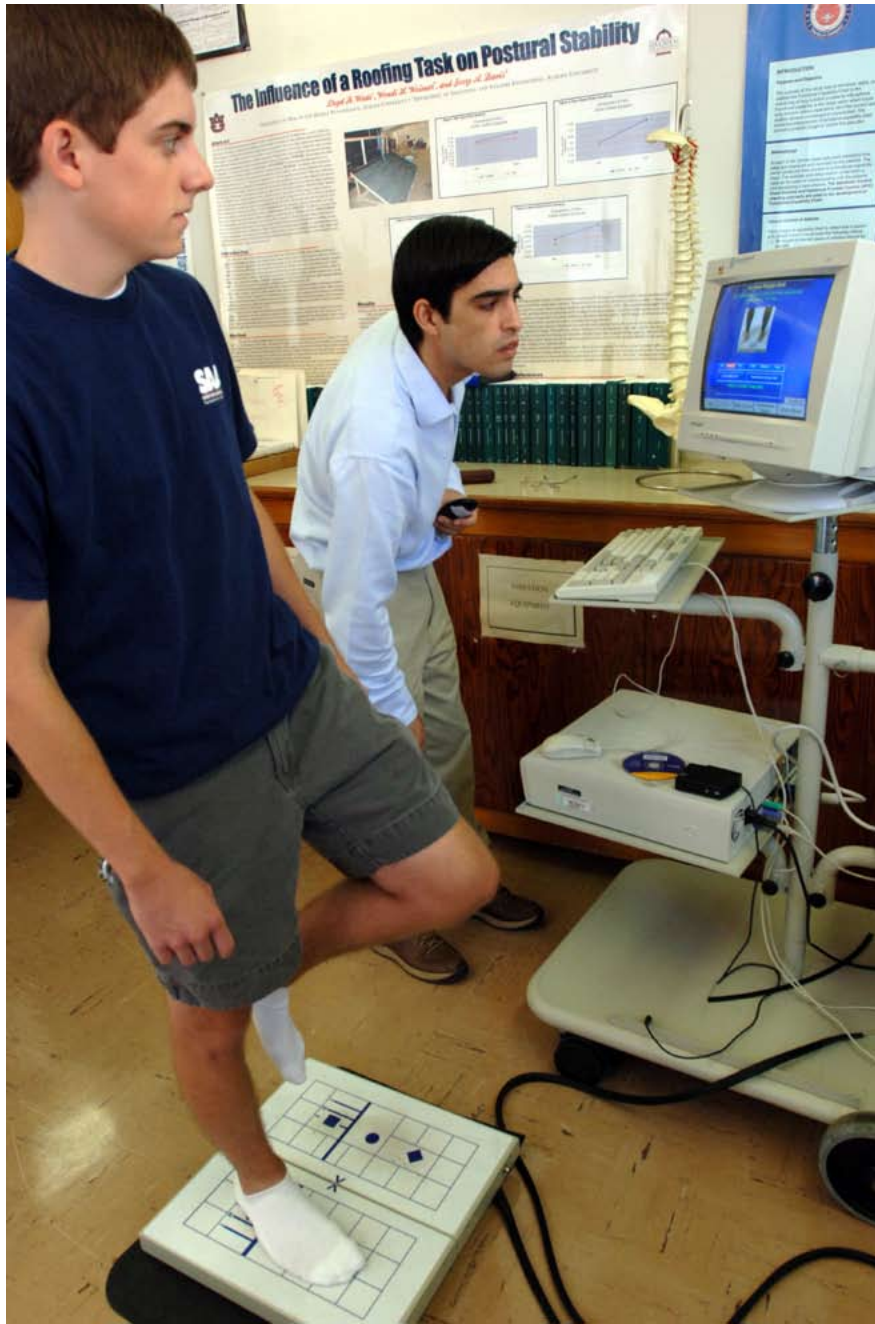
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