

INDUSTRIAL AND SYSTEMS ENGINEERING



REPORT OF  
**Research and  
Scholarly Activities**

Academic Years 2007 – 2008



AUBURN  
UNIVERSITY

# Report of Research and Scholarly Activities

## Academic Years 2007 – 2008

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Robert "Rob" E. Thomas, Professor, Ph.D., P.E., C.P.E.  
Jorge F. Valenzuela, Associate Professor, Ph.D.  
Levent Yilmaz, Associate Professor, Ph.D.

#### ALUMNI COUNCIL MEMBERS

Andrew T. Fischer (Chair)  
Marenda C. Caldwell, C.P.E.  
Kathryn L. Gardner Caspar  
Thomas C. Channell, P.E.  
Adam Farmer  
Gina Edkins Gloski  
Gary R. Godfrey  
David R. Jones  
Elon Maddox  
Leon McGinnis, Ph.D., P.E.  
Rick Reynolds, M.B.A., P.E.  
James T. Treharne, Ph.D.

#### 14 ARCHIVAL SCHOLARLY PUBLICATIONS

**Books and Book Chapters**  
**Journal Articles**  
**Refereed Conference Proceedings**

#### 22 SPONSORED RESEARCH PROJECTS

Alabama Cooperative Extension System - Agricultural Experiment Station  
Air Force Research Laboratory  
College of Engineering  
Continental AG  
Electronics and Telecommunications Research Institute - Korea  
Gul Technologies  
Henkel Electronics  
Mack-Blackwell Transportation Center  
Missile Defense Agency  
National Aeronautics and Space Administration (NASA)  
National Institute for Occupational Safety and Health (NIOSH)  
National Science Foundation  
Rockwell Automation  
Office of Naval Research  
Siemens  
Tripod Inc  
Technology Transfer

#### 25 GRADUATE STUDENT DEGREES

Ph.D. Dissertations  
M.S. Theses

**DEPARTMENT OF**  
**INDUSTRIAL AND SYSTEMS ENGINEERING**  
Samuel Ginn College of Engineering

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- Offers four degrees – BISE, MISE, MS and PhD
- Dual degree MBA/MISE program
- Degree granting since 1932
- Outreach via DVD / internet available for all graduate degrees
- Over 4000 living alumni
- 200 Undergraduates, 100 MS/MISE students, 50 PhD students
- Ranked top 25% of programs by latest *U.S. News & World Report*
- New (2007) automotive manufacturing systems minor for ISE and ME students
- New (2009) automotive manufacturing systems graduate certificate
- Partner with University of Alabama – Birmingham in federally funded (CDC / NIOSH) Deep South Center for Occupational Safety and Ergonomics
- Over \$1.5 million annual research expenditures with sponsorship from NSF, CDC / NIOSH, ONR, NASA, Federal Highway Administration, U.S. Air Force Research Laboratory, Missile Defense Agency and the many corporations and government organizations associated with the NSF I/U CRC Center for Advanced Vehicle Electronics (CAVE)
- Coursework 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, safety
- High achieving alumni including current or past:
  - CEO of Accenture
  - CEO of Gulf Power
  - CEO of Southern Nuclear
  - CEO of Pacific Bell
  - President, Honeywell Sensing & Control
  - CFO of Mirant Corp
  - COO of Apple Computer
  - VP and CIO of Verizon
  - VP of Northrop Grumman
  - Director of U. S. Army Aviation & Missile Control
  - Director of Safety, Johnson & Johnson
  - CEO of COLSA
  - Founder and Chairman, Frontier Technology

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## FACULTY BACKGROUND, AFFILIATIONS AND HONORS

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### **J T. Black, Professor Emeritus, Ph.D., 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

- Fellow, IIE
- Fellow, SME
- Fellow, ASME
- Founding Editor-in-Chief, *Journal of Manufacturing Processes*
- Emeritus Editor-in-Chief, *Journal of Manufacturing Systems*

### **Robert “Bob” L. Bulfin, Technology Management Professor, Ph.D.**



*Ph.D., Georgia Institute of Technology, 1975*

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

### **Gerard “Jerry” A. Davis, Assistant Professor, Ph.D., 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

- HFES: Education Technical Group (ETG)
- HFES: Safety Technical Group (STG)
- ASSE national committee evaluating doctoral level OSH curriculums and research opportunities in the US. (Invited)
- Society for Work Science (SWS), Past-President (2006-07)

## **John L. Evans, Associate Professor, Ph.D.**



*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

- SMTA/CAVE - Conference Chair - Harsh Environment Electronics - Orlando, FL - August 2008
- SMTA - Track Chairmen - SMTA International - Harsh Environment Sessions - Orlando - August 2008
- SMTA - Technical Committee - Since 2001
- Alabama Automotive Manufacturing Association (AAMA) - Workforce Development Committee
- SMTA/CAVE - Conference Chair - Harsh Environment Electronics - Indianapolis, IN - July 2007
- SMTA - Track Chairmen - SMTA International - Harsh Environment Sessions - Orlando - October 2007

## **Kevin R. Gue, Associate Professor, Ph.D.**



*Ph.D., Georgia Institute of Technology, 1995*

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

- Industrial & Systems Engineering Professor of the Year, 2008. Past President, College - Industry Council on Material Handling Education
- Chair, Facility Logistics Special Interest Group, Transportation Science & Logistics Society, INFORMS
- Co-Editor of a special issue of *IIE Transactions on Facility Logistics*
- Associate Editor, *Naval Research Logistics*
- Cluster Chair, Transportation Science & Logistics Society, INFORMS National Meeting, 2007
- Best Paper in Material Handling Award (2006-2007), Material Handling Industry of America; for "Improving the Unit-Load Warehouse" with Russell D. Meller, 2008
- Best Paper in Facility Logistics Track, Industrial Engineering Research Conference, 2008; for "Travel Models for Warehouses with Task Interleaving" with Russell D. Meller and Letitia M. Pohl

**Emmett J. Lodree, Assistant Professor, Ph.D.**



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

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

- Organized and chaired session for INFORMS Annual Conference. October 12-16, 2008. Washington, D.C.
- Organized and chaired session at these conferences: Industrial Engineering Research Conference. May 18-23, 2007 Nashville, TN; INFORMS International Conference. July 8-11, 2007 Puerto Rico; INFORMS Annual Conference, November 4-7, 2007, Seattle, WA

**Saeed Maghsoodloo, Professor, Ph.D., P.E.**



*Ph.D., Auburn University, 1968*

Research in statistical quality control, Taguchi methods and multivariate analysis

- Associate Editor, *IIE Transactions*

**Chan S. Park, Ginn Distinguished Professor, Ph.D., 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

- Fellow, IIE
- Emeritus Editor-in-Chief, *The Engineering Economist*
- Wellington Award Committee, Chair, Engineering Economy Division, Institute of Industrial Engineers

## **Lu Ann Sims, Instructor and Academic Advisor**



*M.S. Georgia Institute of Technology, 1978*

Research in engineering education

- Program Evaluator, ABET
- Undergraduate Academic Advisor
- Faculty Advisor, IIE

## **Alice E. Smith, Professor and Chair, Ph.D., P.E.**



*Ph.D., Missouri University of Science and Technology, 1991*

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

- Fellow, IIE
- Society of Women Engineers National Upward Mobility Award Judge (2007, 2008)
- IEEE Evolutionary Computation Technical Committee (2007-08)
- Editorial Board, *Computers & Operations Research* (Elsevier), 2005-present
- Editorial Board, *International Journal of General Systems* (Taylor & Francis), 2004-present
- Associate Editor, *IEEE Transactions on Evolutionary Computation (IEEE)*, 1998-present
- Design and Manufacturing Editorial Board, *IIE Transactions (IIE)*, 1996-2008
- Associate Editor, *INFORMS Journal on Computing (INFORMS)*, 1995-present
- American Society for Engineering Education (ASEE): Zone II Best Paper Award 2007
- *The Seventh Metaheuristics International Conference (MIC 2007)* (International Program Committee). Montreal

**Jeffrey “Jeff” S. Smith, Professor, Ph.D.**



*Ph.D., Penn State University, 1992*

Research in discrete event simulation and manufacturing systems design and analysis

- College-Industry Council on Material Handling Education - Vice President
- 2008 Track Coordinator, IERC
- 2007-08 Session Chair, Winter Simulation Conference
- 2007 IERC Session Chair
- 2007 IERC Track Coordinator
- 2007 INFORMS National Meeting Session Chair

**Robert “Rob” E. Thomas, Professor, Ph.D., 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

- Senior Member and participant of the American Industrial Hygiene Association
- Co-Chair for Professional Development Symposium: Making the Business Case of Ergonomics at the American Industrial Hygiene Conference and Exhibition (AIHce 08), 1 June, 2008, Minneapolis, MN, Attended by approximately 70 occupational safety and health professionals
- Senior Member and participant of the American Industrial Hygiene Association Ergonomics Committee (elected to the special Steering Group)

**Jorge F. Valenzuela, Associate Professor, Ph.D.**



*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

- Chair of INFORMS Section on Energy, Natural Resources, and the Environment (2006-2008)
- Session chair, INFORMS 2008
- Chair Combined Colloquia, INFORMS 2007
- Session chair, INFORMS 2007
- Session chair, IERC 2007

## Levent Yilmaz, Associate Professor, Ph.D.

Joint Appointment with Computer Science and Software Engineering



*Ph.D., Virginia Tech, 2002*

Modeling and simulation, agent-directed simulation, complex adaptive systems, systems modeling for science and innovation policy, computational modeling of creative scientific discovery systems, software modeling and design

- Editor-in-Chief of *Simulation: Transactions of the Society for Modeling and Simulation International* (2008-present)
- Editorial Board Member of the *International Journal of Simulation and Process Modeling* (2007-present).
- Editorial Board Member of the *Simulation & Gaming Journal* (2008-present).
- Editorial Board Member of the *International Journal of Engineering Education* (2007-present)
- Member of the Board-of-Directors of the Society for Modeling and Simulation International (2007-2008)
- Advisory Board Member of the International Modeling & Simulation Body of Knowledge Initiative (2008-present)
- Advisor to Workforce Development Committee of the Alabama Modeling and Simulation Council (2007- present).
- Program Co-chair, 2007 Summer Computer Simulation Conference, July 15-18, 2007, San Diego, CA, USA
- Founding organizer and Program chair, Agent-Directed Simulation Symposium Series (2007, 2008) of the Spring Simulation Multiconference (SpringSim'08)
- Publications Chair, the 46th ACM Southeast Conference, March 28-29, 2008. Auburn, AL
- Edwards S. and L. Yilmaz, (Editors) Trends in Software Engineering Education, Special Issue of the *International Journal of Engineering Education*, 24(4): August 2008 Affiliate Faculty
- Levent Yilmaz., T. Oren, and Precha Thavikulwat (Editors) Intelligent Agents, Artificial Intelligence, and Simulation Gaming, Special Issue of the *Simulation & Gaming: An Interdisciplinary Journal of Theory, Practice, and Research*, 39(1): 7-9, March 2008.

## Affiliate Faculty

Nathan Dorris, Ph.D., C.P.E.

Dorris & Associates International

Woojin Park, Ph.D.

Federal Government of the Republic of Korea

Robert Rummer, Ph.D., C.P.E.

U.S.D.A. Forest Service

Chip Wade, Ph.D., C.P.E.

Applied Biomechanics and Ergonomics Inc.

## Visiting Scholars

Dr. Sohier Baioumy

Benha University, Egypt

Dr. Sung Ho Choi

Kangnung University, Korea

Dr. Edgardo Escalante

Monterrey Tech University, Mexico

Dr. Un Gi Joo

Sun Moon University, Korea

Dr. Soroor Al-Khafiji

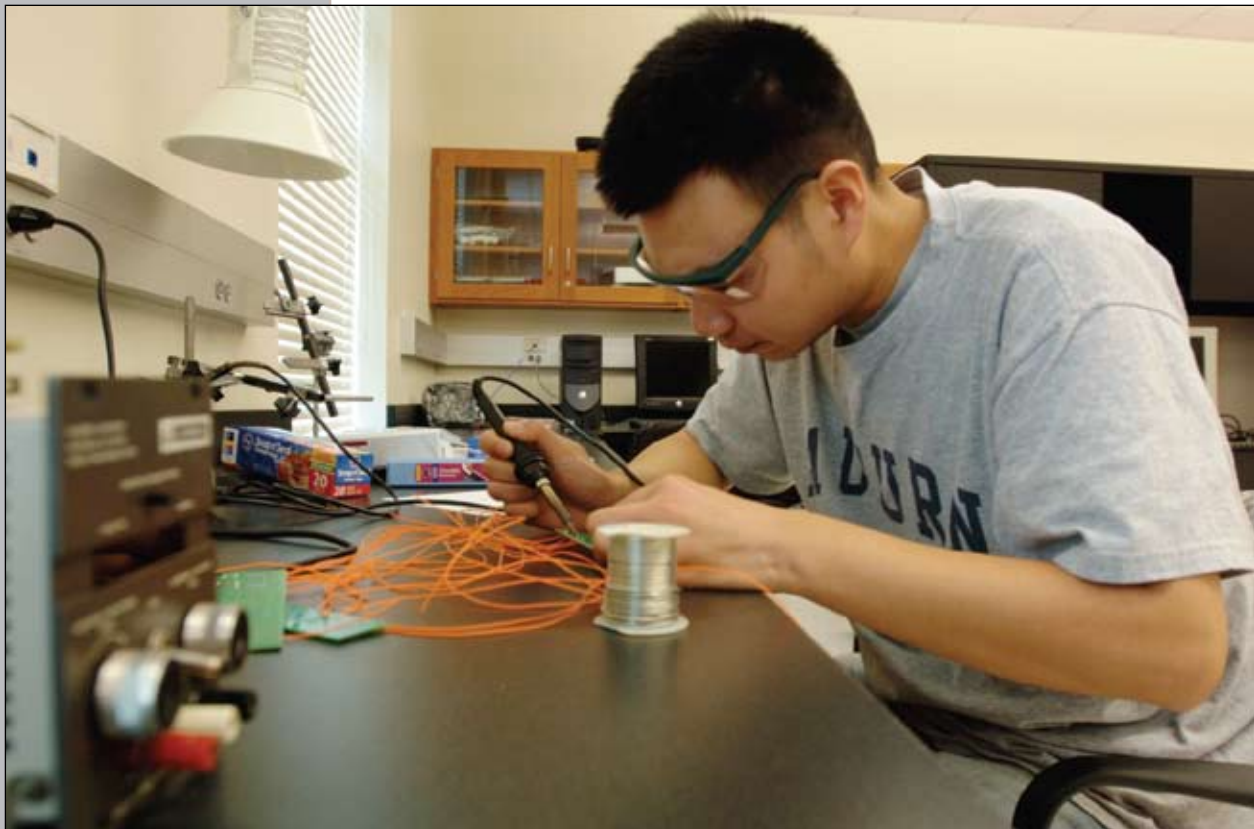
University of Technology, Iraq

Mr. Tom M. A. Marechal

Eindhoven University of Technology, The Netherlands

Dr. Marc Schleyer

Karlsruhe Institute of Technology, Germany



## ALUMNI COUNCIL MEMBERS

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### **Andrew T. Fischer (Chair)**



Corporate Safety and Environmental Director  
Hager Company  
Montgomery, AL  
BIE, 1993; MIE, 1994

### **Marenda C. Caldwell, C.P.E.**



United Parcel Service / Corporate International Retail Services  
Atlanta, GA  
Montgomery, AL  
BIE, 1992

### **Kathryn L. Gardner Caspar**



Marketing Product Manager  
Cooper Lighting  
Peachtree City, GA  
BIE, 2001

### **Thomas C. Channell, P.E.**



Engineer  
U.S. Army Aviation and Missile Command  
Madison, AL  
BIE, 1991; MBA, 1999; MISE, 2006

## ALUMNI COUNCIL MEMBERS

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**Adam Farmer**



Logistics Engineering Manager  
Simmons Bedding Company  
Mableton, GA  
BISE, 2002; MS, 2004

**Gina Edkins Gloski**



Principal  
Semiconductor Operations Consulting  
Shirley, MA  
BIE, 1982

**Gary R. Godfrey**



Partner  
Accenture  
Atlanta, GA  
BIE, 1986

**David R. Jones**



Manager Material Control – Supply Chain  
American Cast Iron Pipe Company  
Birmingham, AL  
BIE, 1991

## ALUMNI COUNCIL MEMBERS

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### **Elon Maddox**



Lead Financial Analyst  
AT&T  
Birmingham, AL  
BIE, 1973; MIE, 1974

### **Leon McGinnis, Ph.D., P.E.**



Eugene C. Gwaltney Professor of Manufacturing Systems  
School of Industrial and Systems Engineering  
Georgia Tech  
Atlanta, GA  
BIE, 1970

### **Rick Reynolds, M.B.A., P.E.**



Principal  
Vital X Consulting Group  
Auburn, AL  
BIE, 1988

### **James T. Treharne, Ph.D.**



Colonel (Retired)  
U.S. Army  
Deputy Division Chief, Operational Capability Assessments  
Center for Army Analysis  
Fort Belvoir, VA  
MSIE, 1991; PhD (ISE) 1999

# ARCHIVAL SCHOLARLY PUBLICATIONS

## Books and Book Chapters

R. Muhdi and **Gerard A. Davis**, "Ergonomic Hazards and Repetitive Strain Injuries: Cost Analysis and Budgeting." *The Safety Professional Handbook, Technical Applications: American Society of Safety Engineers (ASSE)*, Des Plaines, IL, edited by J. Haight, 956-977 (2008)

J. Bartholdi, **Kevin R. Gue** and K. Kang, "Staging Protocols for Unit-Load Crossdocking," in *Facility Logistics: Approaches and Solutions to Next Generation Challenges*. Edited by M. Lahmar, Auerbach Publications, 153-172 (2007)

**Emmett J. Lodree**, "Scheduling Approaches to Order Picking," *Progress in Material Handling Research*. Edited by K. Ellis, R. Meller, M. Ogle, B. Peters, G. Taylor and J. Usher, 357-369 (2008)

**Chan S. Park**, "Fundamentals of Engineering Economics", 2nd edition, Prentice Hall (629 pages) (2008)

**Chan S. Park** and H-C Sung, "Basic Engineering Economics", Youngji (384 pages). (Note: written in Korean and is expected to be adopted by major engineering schools in Korea) (2008)

**Alice E. Smith** and Y-C Liang, "Ant Colony Paradigm for Reliable System Design," *Computational Intelligence in Reliability Engineering* (edited by G. Levitin), Springer-Verlag, Berlin, Chapter 1, 1-20 (2007)

**Alice E. Smith**, S-S Kim and S-J Hong, "Dynamic load Balancing Using an Ant Colony Approach in Micro-Cellular Systems," in *Advances in Metaheuristics for Hard Optimization* (edited by P. Siarry and Z. Michalewicz) Springer's Natural Computing Series, Springer Verlag, Germany, 137-152 (2007)

**Jeffrey S. Smith** and B. Kim, "Dynamic Slotting for Zone-Based Distribution Center Picking Operation," in *Progress in Material Handling Research: 2008*, edited by K. Ellis, R. Meller, M. Ogle, B. Peters, D. Taylor, J. Usher, The Material Handling Institute, Charlotte, NC. 578-601 (2008)

**Levent Yilmaz** "Collaborative Technology: Improving Team Cooperation and Awareness in Distance Learning for IT Education," Chapter 8 in the Handbook of *Distance Learning for Real-time and Asynchronous Information Technology*. (edited by S. Negash, M. Whitman, A. Woszczyński, K. Hoganson and H. Mattford), 157-169 (2008)

**Levent Yilmaz** and A. Tolk, "A Unifying Multimodel Taxonomy and Agent-Supported Multisimulation Strategy for Decision-Support," in *Studies in Computational Intelligence (SCI) Intelligent Decision Making: An AI-based Approach* (edited by Phillips-Wren, Ichalkaranje, and Lakhmi). vol. 97, 189-222 (2008)



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## Journal Articles

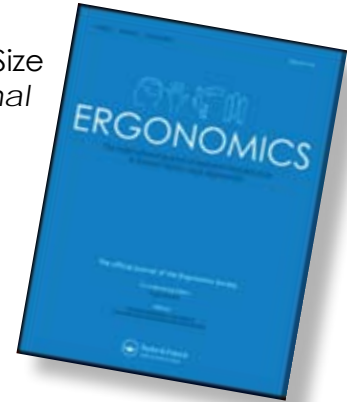
**J T. Black**, "Design Rules for Implementing the Toyota Production System", *International Journal of Production Research*, 45(16): 3639-3664 (2007)

R. M'Hallah and **Robert L. Bulfin**, "Minimizing the Weighted Number of Tardy Jobs on a Single Machine With Release Dates," *European Journal of Operational Research*, 176: 727-744 (2007)

P.H. Koo, **Robert L. Bulfin** and S-G Koh, "Determination of Batch Size at a Bottleneck Machine in Manufacturing Systems," *International Journal of Production Research*, 45(5): 1215-1231 (2007)

G. Holman, **Gerard A. Davis** and **Saeed Maghsoodloo**, "The Effects of Dynamic Movement on Reach Arcs," *Ergonomics*, 51(5): 691-701 (2008)

S. Walker, **Gerard A. Davis** and D. Desai, "Postural Assessments and Job Rotation," *Journal of the American Society of Safety Engineers*, 53(2): 32-36 (2008)



**John L. Evans**, P. Lall, E. Crain, T. Shete and J. Thompson, "System Design Issues for Harsh Environment Electronics Employing Metal-backed Laminate Substrates," *IEEE Transactions on Components and Packaging Technologies*, 31(1): 74-85 (2008)

P. Lall, I. Nokibul, **John L. Evans** and J. Suhling, "Reliability of BGA and CSP on Metal-Backed Printed Circuit Boards in Harsh Environments," *ASME Transactions*, 129: 383-289 (2007)

M. Bozack, J. Davis, and **John L. Evans**, "Effect of Au NiSn<sub>4</sub> on Sn-37Pb/ENIG Solder Joint Reliability under Isothermal and Temperature-Cycled Conditions," *IEEE Transactions on Components and Packaging Technologies*, 30(1): 32-41 (2007)

**Kevin R. Gue** and B.S. Kim, "Puzzle-Based Storage Systems," *Naval Research Logistics*, 54(5): 556-567 (2007)

**Kevin R. Gue**, "Warehouses Without Inventory," *International Commerce Review*, 7(2): 124-132 (2007)

**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)

**Emmett J. Lodree** and B. Uzochukwu, "Production Planning for a Deteriorating Item with Stochastic Demand and Consumer Choice," *International Journal of Production Economics*, 116(2): 219-232 (2008)



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**Emmett J. Lodree** and S. Taskin, "An Insurance Risk Management Framework for Disaster Relief and Supply Chain Disruption Inventory Planning," *Journal of the Operational Research Society*, 59(5): 674-684 (2008)

**Emmett J. Lodree**, Y. Kim and W. Jang, "Time and Quantity Dependent Waiting Costs in a News Vendor Problem with Backlogged Shortages," *Mathematical and Computer Modeling*, 47: 60-71 (2008)

F. Hayati, **Saeed Maghsoodloo**, M. Devivi, **Robert E. Thomas** and C. Lemiere, "Quality Control Chart Method for Analyzing PEF Variability in Occupational Asthma," *American Journal of Industrial Medicine*, 51(3): 223-228 (2008)

S. Sozer, **Chan S. Park** and **Jorge Valenzuela**, "Economic Analysis of Electric Power Transmission Expansion," *The Engineering Economist*, 53(4): 293-317 (2008)

H. Han and **Chan S. Park**, "A Study on Estimating Investment Timing of Retained Real Options," *The Engineering Economist*, 53(3): 197-229 (2008)

O. Alagoz, B. Norman, and **Alice E. Smith**, "Determining Aisle Structures for Facility Designs Using a Hierarchy of Algorithms," special issue in Facility Logistics of *IIE Transactions*, 40(11): 1019-1031 (2008)

S. Kulturel-Konak, **Alice E. Smith** and B. Norman, "Multi-objective Facility Expansion and Relayout," *IIE Transactions*, 39(7): 747-761 (2007)

S.S. Kim, **Alice E. Smith** and J-H Lee, "A Memetic Algorithm for Channel Assignment in Wireless FDMA Systems," *Computers and Operations Research*, 34: 1842-1856 (2007)



O. Dengiz, R. McAfee, I. Nettleship and **Alice E. Smith**, "The Application of Automated Image Analysis to Dense Heterogeneities in Partially Sintered Alumina," *Journal of the European Ceramic Society*, 27(4): 1927-1933 (2007)

H. Yapicioglu, **Alice E. Smith** and G. Dozier, "Solving the Semi-desirable Facility Location Problem Using Bi-objective Particle Swarm," *European Journal of Operational Research*, 177(2): 733-749 (2007)

A. Farmer, **Jeffrey S. Smith** and L. Miller, "Umpire Crew Scheduling for Professional Tennis Tournaments," *Interfaces*, 27(2): 187-196 (2007)

D. Mitchell, T. Gallagher and **Robert E. Thomas**, "The Human Factors of Implementing Shift Work in Logging Operations," *Journal of Agricultural Safety and Health*, 14(4): 391-404 (2008)



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R. Varadarajan, K. Barker, E. Flynn and **Robert E. Thomas**, "Comparison of Two Error-Detection Methods In a Mail Service Pharmacy Serving Health Facilities," *Journal of Industrial Medicine*, 51(3): 223-228 (2008)

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

**Jorge Valenzuela**, G. Ramasamy and H. Ramaswamy, "A Feeder Replenishment Policy of a Turret-Head Placement Machine," *International Journal of Production Research*, 45(8): 1861-1879 (2007)

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 Operational Research*, 181: 1309-1321 (2007)

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

M. Bradley and **Levent Yilmaz**, "Symbiotic Adaptive Multisimulation: An Autonomic Simulation Framework for Real-time Decision Support under Uncertainty," *ACM Transactions on Modeling and Simulation*, 19(1)(2008)

**Levent Yilmaz**, "Reasoning about Conceptual Interoperability of Simulations using Metalevel Graph Relations," Special issue on *Ontology-driven Interoperability of the Intelligent Decision Technologies Journal*, 2(1): 33-51 (2008)

J. Phillips and **Levent Yilmaz**, "Team-RUP: Agent-based Simulation of Team Behavior in Software Development Organizations," *International Journal of Simulation and Process Modelling*, 3(3),170-179 (2007)

**Levent Yilmaz** and J. Phillips, "The Impact of Turbulence on the Effectiveness and Efficiency of Software Development Teams in Small Organizations," *Software Process: Improvement and Practice Journal*, 12(3): 247-265 (2007)

**Levent Yilmaz**, "A Strategy for Improving Dynamic Composability: Ontology-driven Introspective Agent Architectures," *Journal of Systemics, Cybernetics, and Informatics*, 5(5): 1-9 (2007)

**Levent Yilmaz**, "Toward Next Generation Simulation-based Computational Tools for Conflict and Peace Studies," *Social Science Computer Review*, 25(1): 48-60 (2007)



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

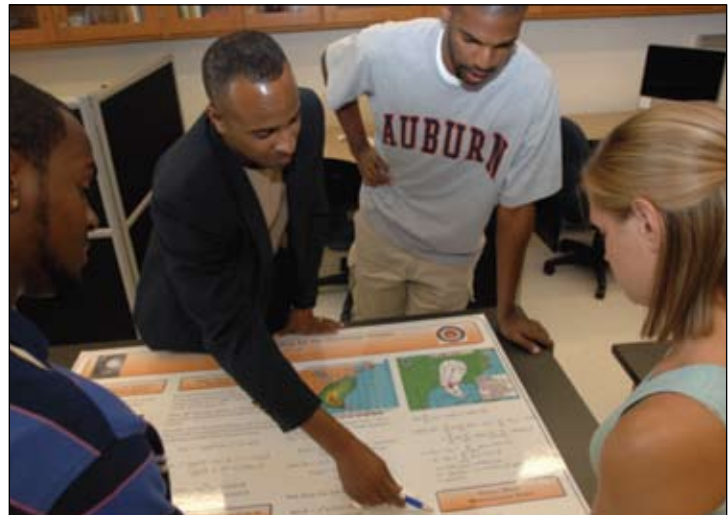
## Refereed Conference Proceedings

R. Muhdi and **Gerard A. Davis**, "Helping Safety Managers Make Project Decisions in the Workplace: The Weighted Scoring Decision Making Approach," *Proceedings of the American Society of Safety Engineers Annual Meeting* (2007)

S. Gwynne, R. Muhdi and **Gerard A. Davis**, "Development and Validation of Crawling Model in Existing Computational Egress Tool," *Proceedings of the 11th International Conference on Fire Science and Technology*, (2007)

E. Boelhouwer, G. Holman and **Gerard A. Davis**, "Front-end Discharge Versus Rear-end Discharge Ready Cement Trucks," *Proceedings of the 2007 American Society of Safety Engineers Professional Conference*, Orlando, FL (2007) (Poster)

D. Sakamser, **John L. Evans**, Z. Li, C. Reid and B. Sloka, "Testing Passive Components for Flexure Crack Performance," *Proceedings of the Surface Mount Technology Association International*, Orlando, FL (2007)



**Dr. Emmett Lodree with his research team**

A. Piper, E. Boelhouwer, **Gerard A. Davis**, G. Holman and S. Montgomery, "Using Hand Drawn Images to Determine Warning Symbol Design Parameters within Interactive Evolutionary Computation Software." *Proceedings of the Human Factors and Ergonomics Society (HFES), 52<sup>nd</sup> Annual Meeting*, 1708-1711 (2008)

A. Piper, L. Montgomery and **Gerard A. Davis**, "Incorporating Artificial Intelligence into Safety Symbol Design with Focus Groups," *Proceedings of the Industrial Engineering Research Conference*, (2008)

J. Cobb, **John L. Evans**, S. Hill, H-C Pai, D. Samsner, N. Vijayakumar and F. Xie, "Impact of Component Termination on Conductive Adhesive Reliability for Harsh Environment Electronics" *Proceeding of Harsh Environment Electronics Workshop*, Proceeding CD, Orlando, FL (2008)

M. Bozack, **John L. Evans**, P. Lall, C. Mitchell, J. Suhling and Y. Zhang, "Properties of Mixed Formulation Solders", *Proceedings of the Surface Mount Technology Association International*, Proceeding CD, Orlando, FL (2008)

L. Pohl, R. Meller, and **Kevin R. Gue**, "An Evaluation of Two New Warehouse Aisle Designs for Dual-Command Travel," in *Proceedings of the 2007 Industrial Engineering Research Conference*, eds. G. Bayraksan, W. Lin, Y. Son, and R. Wysk (2007)

L. Pohl, R. Meller, and **Kevin R. Gue**, "Travel Models for Warehouses With Task Interleaving," *Proceedings of the 2008 Industrial Engineering Research Conference*, eds. J. Fowler and S. Mason (2008)

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G. Taylor and **Kevin R. Gue**, "The Effects of Empty Storage Locations in Puzzle-Based Storage Systems," *Proceedings of the 2008 Industrial Engineering Research Conference*, eds. J. Fowler and S. Mason (2008)

**Kevin R. Gue**, G. Ivanovic and R. Meller, "Improving a Unit-Load Warehouse That Has Multiple Pickup and Deposit Points," *Progress in Material Handling Research*, 234-250 (2008)

A. McLendon, C. Geiger and **Emmett J. Lodree**,

"Scheduling Parallel Machines With Machine Eligibility Restrictions Minimizing Total Weighted Tardiness," *Industrial Engineering Research Conference*, May 19-23, Nashville, TN, CD-ROM (2007)

H. Lee, S. Taskin, C. Griffin and **Emmett J. Lodree**, "The Effectiveness of Transshipment in an Inventory System with Dependent Demand Among Multiple Retailers," *Institute of Industrial Engineers Annual Industrial Engineering Research Conference*, May 19-23, Nashville, TN, CD-ROM (2007)

C. Geiger, **Emmett J. Lodree** and O. Martinez, "A Multiobjective Modeling Approach for Joint Maintenance and Spare Parts Inventory Policy Optimization," *Industrial Engineering Research Conference*, May 19-23, Nashville, TN, CD-ROM (2007)

C. Soares, G. Dozier, **Emmett J. Lodree**, J. Phillips, K. Nobles and Y-W Park, "Optimization of the Multiple Retailer Supply Chain Management Problem," *Association for Computing Machinery Southeast Conference*, March 28-29, Auburn, AL (2008)

S. Baioumy, H. Liu and **Alice E. Smith**, "Application of Kriging to Cost Estimation," *Proceedings of the 9<sup>th</sup> Cairo University International Conference on Mechanical Design and Production (MDP-9)*, Cairo, Egypt, January 8-10, 1546-1556 (2008)

H. Liu, **Alice E. Smith**, H. Yapicioglu and G. Dozier, "Application of Statistical Estimators to Expanding Pareto fronts," in *JSM Proceedings*, Statistical Computing Section, Alexandria, VA: American Statistical Association, on line format (2008)

H. Liu and **Alice E. Smith**, "A Novel Particle Swarm Optimizer with Kriging Models," Intelligent Engineering Systems through Artificial Neural Networks: Smart Systems Engineering: Computational Intelligence in Architecting Complex Engineering Systems, vol. 17, *Proceedings of the Artificial Neural Networks in Engineering Conference (ANNIE 2007)*, held November 11-14, 2007, in St. Louis, MO, edited by C. Dagli, A. Buczak, D. Enke, M.J. Embrechts, and O. Ersoy, ASME Press Series on Intelligent Engineering Systems Through Artificial Neural Networks, New York, NY, 353-358 (2007)



2008 NSF REU Site Participants at Hyundai

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**2007 NSF RET teachers participate in research projects of the NSF I/U CRC Center for Advanced Vehicle Electronics (CAVE)**

V. Ustun and **Jeffrey S. Smith**, "An Agent-Based Simulation Model for the Analysis and Design of Physical Security Systems", *Proceedings of the 2007 Modeling, Simulation and Gaming Student Capstone Conference* (2007)

**Jeffrey S. Smith**, J. Hamilton, B. Nelson, L. Schruben, R.E. Nance and G. Riley, "Panel Discussion: What Makes Good Research in Modeling and Simulation: Assessing the Quality, Success, and Utility of M&S Research," *Proceedings of the 2008 Winter Simulation Conference*, Miami, FL (2008)

**Jeffrey S. Smith** and Y. Cho, "Offline

Commissioning of a PLC-Based Control System Using Arena," *Proceedings of the 2008 Winter Simulation Conference*, Miami, FL (2008)

V. Ustun and **Jeffrey S. Smith**, "Mental Simulation for Creating Realistic Behavior in Physical Security Systems Simulation," *Proceedings of the 2008 Winter Simulation Conference*, Miami, FL (2008)

**Jorge Valenzuela**, **Gerard A. Davis** and **LuAnn Sims**, "Undergraduate Research in Automotive Manufacturing Systems at Auburn University," *Proceedings of the ICEE Conference 2008*, Budapest, Hungary (2008)

**Levent Yilmaz** and **Jeffrey S. Smith**, "Prelude to the Panel on What Makes Good Research in Modeling and Simulation," *ACM/IEEE Winter Simulation Conference*, pp. 671-677. Miami, FL. (2008)

**Levent Yilmaz**, P. Davis, P. Fishwick, X. Hu, J. Miller, M. Hybinette, T. Oren, P. Reynolds, H. Sarjoughian, and A. Talk, "What Makes Good Research in Modeling and Simulation: Sustaining the Growth and Vitality of the M&S Discipline," *ACM/IEEE Winter Simulation Conference*, 677-688. Miami, FL. (2008)



**Levent Yilmaz**, "Autonomic Introspective Simulation Systems: Concepts and Applications," in *Proceedings of the Summer Computer Simulation Conference (SCSC'08) of 2008 International Simulation Multiconference and 2008 Summer Simulation Multiconference*, 1-8. Edinburgh, UK. (2008)

J. Xu, **Levent Yilmaz**, and J. Zhang, "Agent Simulation of Collaborative Knowledge Processing in Wikipedia," in *Proceedings of the Agent-Directed Simulation Symposium of the SpringSim Multiconference*. 19-25. April 14-17, Ottawa, Canada (2008)

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**Levent Yilmaz**, "Innovation Systems are Self-organizing Complex Adaptive Systems," In *Proceedings of the Creative Intelligent Systems Workshop of the AAAI Spring Symposium (SS-08-03)*, 142-148. AAAI Press. Stanford University, California. (2008)



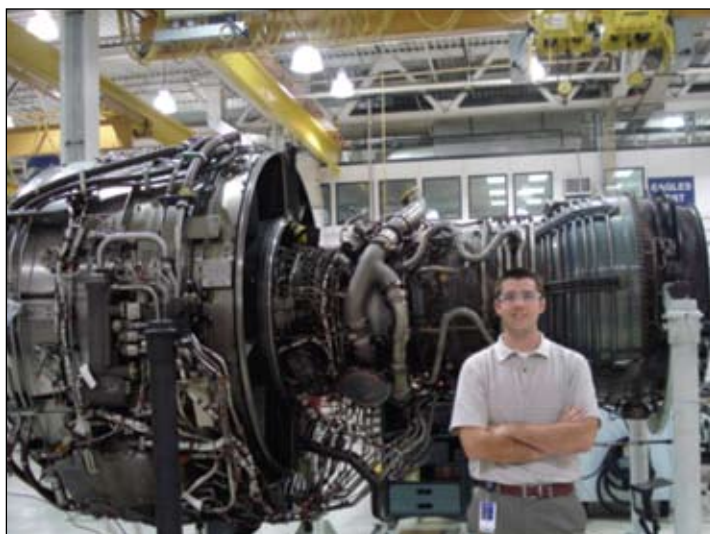
**Levent Yilmaz**, "Exploring the Impact of Employee Turnover on the Effectiveness of Software Development Team Archetypes," in *Proceedings of the Agent-Directed Simulation Symposium of the Spring Simulation Multiconference (SMC'07)*, pp. 94-101. Norfolk, VA, March (2007)

T. Oren, G.A. Nasser and **Levent Yilmaz**, "An Ontology-Based Dictionary of Understanding as a Basis for Software Agents with Understanding Abilities," in *Proceedings of the Agent-Directed Simulation Symposium of the Spring Simulation Multiconference (SMC'07)*, pp. 19-27. Norfolk, VA (2007)

**Levent Yilmaz** and T. Oren (2007). "On Multiresolution Simulation Modeling of Team and Human Behavior for Software Process Design," in *Proceedings of the Tenth World Congress On Integrated Design and Process Technology*, 210-219, Antalya, Turkey (2007)

**Levent Yilmaz**, "Simulation Modeling of Software Processes as Human-centered Adaptive Work Systems," in *Proceedings of the European Software Process Improvement and Innovation Conference (EuroSPI2 2007)*, LNCS 4764, pp. 148-159, 26-28 September 2007, Potsdam, Germany (2007)

**Levent Yilmaz**, "Using Meta-level Ontology Relations to Measure Conceptual Alignment and Interoperability of Simulation Models," in *Proceedings of the 2007 ACM/IEEE Winter Simulation Conference*, 1090-1099. Washington D.C. (2007)



**Levent Yilmaz**, A. Lim , S. Bowen and T. Oren, "Requirements and Design Principle for Multisimulation with Multiresolution, Multistage Models," in *Proceedings of the 2007 ACM/IEEE Winter Simulation Conference*, 823-832. Washington D.C. (2007)

**Levent Yilmaz** and T. Oren , "Agent-directed Simulation Systems Engineering," in *Proceedings of 2007 Summer Computer Simulation Conference*, 897-904. San Diego, CA, July 14-19, (2007)

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## SPONSORED RESEARCH PROJECTS

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### Alabama Cooperative Extension System - Agricultural Experiment Station

**Emmett J. Lodree** and Norbert Wilson, "Improving the Supply Chain Management of Alabama Turf Grass Producers." (\$50,000). Co-PIs, Deacue Fields and David Han

### Air Force Research Laboratory

**Levent Yilmaz**, co-PI: Alvin Lim. "Insertion of Multiresolution Simulation Technology into a Federated Simulation Infrastructure." (\$121,647).

### College of Engineering

**Gerard A. Davis**, "COE Safety Project." (\$55,000)

### Continental AG

**Jeffrey S. Smith** and **John L. Evans**, "Simulation Modeling and Analysis Support," (\$93,000)

### Electronics and Telecommunications Research Institute - Korea

**Chan S. Park**, "An Analysis of the Mobile Market Structure and Industrial Systems in U.S.A.: Focusing on MVNO, Roaming, and the Distribution Channels." (\$30,000)

### Gul Technologies

**John L. Evans**, "Automotive Substrate Technology." (\$30,000)

### Henkel Electronics

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

### Mack-Blackwell Transportation Center

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

### Missile Defense Agency

**Levent Yilmaz**, co-PI: Michael Stoddard (Trident Systems Incorporated). "An Agent-supported Scalable Test Framework for Complex System of Systems." (\$46,770)

### National Aeronautics and Space Administration (NASA)

**Alice E. Smith** and **Jeffrey S. Smith**, "Academy of Aerospace Quality – Phase II," (\$230,890)

### National Institute for Occupational Safety and Health (NIOSH)

**Gerard A. Davis** and **Robert E. Thomas**, NIOSH ERC Training Grant T42/OH00843436-07; "Occupational Injury Prevention Research Training." (\$87,514)

**Gerard A. Davis** and **Robert E. Thomas**, NIOSH ERC Training Grant T42/OH00843436-07; "Occupational Injury Prevention Research Training." (\$98,257)

**Robert E. Thomas** and **Gerard A. Davis**. NIOSH ERC Training Grant T42/OH008434-07; "Occupational Safety and Ergonomics Program." (\$197,020)

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**Robert E. Thomas** and **Gerard A. Davis**. NIOSH ERC Training Grant T42/OH008434-07; "Occupational Safety and Ergonomics Program." (\$199,489)

**Robert E. Thomas** and **Gerard A. Davis**. NIOSH ERC Training Grant T42/OH008434-07; "Occupational Safety and Ergonomics Program." (\$203,725)

**Robert E. Thomas** and **Gerard A. Davis**. NIOSH ERC Training Grant T42/OH00843436-07; "Occupational Injury Prevention Research Training." (\$98,385)

### National Science Foundation (NSF)

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

**John L. Evans**, "Harsh Environment Testing for Integrated Electronics – Phase III – NSF's Center for Advanced Vehicle Electronics (CAVE)." Development of Overmolding Testing with COB and Low CTE Substrate for Next Generation Integrated Modules. (\$200,000)

**John L. Evans**, "Harsh Environment Testing for Integrated Electronics – Phase IV – NSF's Center for Advanced Vehicle Electronics (CAVE)." Development of Overmolding Testing with COB and Low CTE Substrate for Next Generation Integrated Modules. (\$200,000)

**John L. Evans**, "Advanced Capacitor Technology for Automotive Applications - NSF's Center for Advanced Vehicle Electronics (CAVE)." (\$75,000)

**John L. Evans**, Center for Advanced Vehicle Electronics (CAVE) – 5 Year Renewal – National Science Foundation – 2005-2009 – (with J. Suhling – PI, P. G. Lall, G. M. Flowers, M. Bozack, R. Knight). (\$180,000)

**Kevin R. Gue**, "Designing Distribution Centers for the Service Economy," co-PI: R. Meller (Univ. Arkansas). (\$400,000, approx. \$170,000 to Auburn)

**Emmett J. Lodree**, **Gerard A. Davis** and **Robert L. Bulfin**, "Sequencing Human Tasks: A New Paradigm for Scheduling Research, Graduate Research Supplement." (\$27,280)

**Emmett J. Lodree**, **Gerard A. Davis** and **Robert L. Bulfin**, "Sequencing Human Tasks: A New Paradigm for Scheduling Research." (\$199,319).

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

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

**Alice E. Smith**, "US-Turkey Workshop: on Women in Industrial Engineering Academia - U.S. and Middle East." (\$60,000)

**Alice E. Smith**, "ADVANCE Partnerships for Adaptation, Implementation and Dissemination: SEM Transformation through "Small Wins"", with PI D. Sollie and co-PIs M. Wooten, O. Jenda and Daniel Svyantek, #SBE-0620000. (\$450,000)



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**Alice E. Smith**, "Industry / University Cooperative Research Center for Advanced Vehicle Electronics (CAVE), Research Experiences for Teachers," with J. Suhling (Mechanical Engineering, Auburn University), (NSF), Supplements to #EEC-9907749, (\$165,400)

**Jorge Valenzuela**, "GOALI: Collaborative Research - A Systems Approach to Modeling Real-Time Market Prices of Electricity," with co PI M. Mazumdar (Univ. Pittsburgh) (\$280,000).

**Jorge Valenzuela**, "Research Experiences for Undergraduates," supplement to grant # 0245650, (\$6,000)

**Jorge Valenzuela** and **Gerard A. Davis**, "REU Site in Automotive Manufacturing Systems." (\$285,400)

**Jorge Valenzuela** and **Gerard A. Davis**, "U.S. – Korea: Planning Visit to Add an International Experience to REU." (\$13,651)

**Levent Yilmaz** (with B. Edwards, Co-PI), "Dynamics of Creativity and Innovation in Virtual Scientific Commons." (\$315,029)

**Levent Yilmaz**, "The Synergy of Conflict and Creativity in Open Source Software Development Communities." (\$76,450)

### Rockwell Automation

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

### Office of Naval Research

**Kevin R. Gue**, "Dynamic Resource Allocation to Improve Service Performance in Order Fulfillment Systems." (\$145,177)

**Kevin R. Gue**, "Surge Operations for Distribution Centers." (\$137,084)

### Siemens

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

### Tripod Inc

**John L. Evans**, "Harsh Environment Substrate Technology." (\$60,000)

### Technology Transfer

**Levent Yilmaz** and Trident Systems Inc., "Safe Test Boundary (STB) Technology- An Approach and Algorithms for Understanding the Indirect Impact of Change Between Two Large, Complex Software Source Code Baselines With the Goal to Greatly Reduce the Amount of Re-testing Required for the System Upgrades." Received \$841K in SBIR investment and generated \$1.6 Million revenue. Listed in the Navy 2007 book, *SBIR/STTR Success Stories in Small Business Innovation Research/ Small Business Technology Transfer*, as one of the top 50 technologies transferred.



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# GRADUATE STUDENT DEGREES

## Ph.D. (Dissertations)

Huseyin Balci, "Valuation of Power Generation Investments in Deregulated Capacity Markets"

Advisor – **Jorge Valenzuela**

Currently IRP Analyst, Dominion Resources

Orhan Dengiz, "Maximizing Connectivity and Performance in Mobile Ad Hoc Networks Using Mobile Agents"

Advisor – **Alice E. Smith**

Currently Vice President, DnD Technical Solutions, Ankara, Turkey

Hyun Jin Han, "Estimating Project Volatility and Developing Decision Support System in Real Options Analysis"

Advisor – **Chan S. Park**

Currently Lt. Colonel, Army of Republic of Korea

Grady Holman, "Patient Handling: Restrictions & Conditions"

Advisor – **Robert E. Thomas**

Currently Assistant Professor of Industrial Engineering, University of Louisville

Ching Ying Huang "Comparing the Overlapping of Two Independent Confidence Intervals with a Single Confidence Interval for Two Normal Population Parameters"

Advisor – **Saeed Maghsoodloo**

Currently Instructor, Department of Business Administration, Chang Gung University, Taiwan



*Dr. Kevin Gue and his research team*

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Pinar Kaymaz, "Electric Power Generation Expansion in Deregulated Markets"  
Advisor – **Jorge Valenzuela**  
Currently Senior Analyst, Entergy

Rani Muhdi, "The Development and Representation of Occupant Performance  
in Building Evacuation Modeling"  
Advisor – **Gerard A. Davis**  
Currently Assistant Professor of Engineering Management and Systems  
Engineering, Old Dominion University

Selda Taskin, "Supply Chain Planning for Hurricane Response with Information  
Updates"  
Advisor – **Emmett J. Lodree**  
Currently with ASELSAN, Ankara, Turkey

Haluk Yapicioglu, "Retail Spatial Design with a Racetrack Aisle Network  
Considering Revenue and Adjacencies"  
Advisor – **Alice E. Smith**  
Currently Post Doc, Department of Industrial and Systems Engineering, Auburn  
University

Ahmet Yucekaya, "Electric Power Bidding Models for Competitive Markets"  
Advisor – **Jorge Valenzuela**  
Currently Assistant Professor, Kadir Has University, Istanbul, Turkey

Duoxing Zhang, "Real Options Evaluation of Financial Investment in Flexible  
Manufacturing Systems in the Automotive Industry"  
Advisor – **John L. Evans**  
Currently Project Manager, Business Development China, Schaeffler Group China

## M.S. (Theses)

Veysel Dalkilic, "A Supply Chain Approach to Shelf Space Allocation"  
Advisor – **Jeffrey S. Smith**  
Currently IT Specialist, EnerjiSA, Istanbul, Turkey

Goran Ivanovic, "Aisle Designs for Unit-Load Warehouses with Multiple Pickup  
and Deposit Points"  
Advisor – **Kevin R. Gue**  
Currently Analyst, Knapp Logistics

Kyongsun Kim, "Group Versus Staggered Replacement Policy – Strategic  
Replacement Decisions"  
Advisor – **Chan S. Park**  
Currently Captain, Army of Republic of Korea

Joshua Ridenour, "Overmolded Substrate on Aluminum Metal Backing for Harsh  
Environment Applications"  
Advisor – **John L. Evans**  
Currently Engineer, Redstone Arsenal

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*2008 NSF Women in IE Academia Workshop participants (Ankara, Turkey)*



*2008 Alpha Pi Mu class*



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