

Department of Industrial and Information Engineering

Student Spotlight



Isaac Mitchell

Isaac Mitchell, a recent Industrial Engineering graduate, is currently living in Cincinnati, Ohio, and working for Toyota Motor Manufacturing North America, Toyota's North American headquarters. He is a specialist in their Production Control Department and his group, Service Parts, is involved in ensuring that replacement car parts are readily available to customers and ensuring that they meet Toyota's Specifications along with managing the information systems to track supplier performance and requirements.

While attending the university, Isaac was very active in the department and The Institute of Industrial Engineers (IIE) and had the following comments about his involvement. "IIE has played a major role in my leadership and career development. I joined IIE my sophomore year after learning about the organization from fellow University of Tennessee students at my

co-op assignment with Sea Ray Boats. As an underclassman it was a wonderful opportunity to meet several of the department professors and staff along with many of the upperclassmen students. During my junior year I served as chapter secretary which enabled me to learn about IIE and the operational activities of the organization. My senior year I was elected President and had the opportunity to host the 2005 IIE Region II Conference in Knoxville. This was a great learning experience that helped hone my leadership and organization skills. I was able to network with students and professors throughout the region. IIE has been a wonderful experience that has helped me to develop several useful skills for working in the industry and lead to many great friendships."

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Congratulations to our Spring 2005 Graduates

Undergraduate

Zachary Cantalini	James Collignon, Jr.	Shaker El-Akkad
Marcus Greene	Bethany Gregory	Mikel Grubb
Jonathan Holt	Steven Howerton	Andrew Jenkins
Gregory Lawson	Thomas Seth Martin	Isaac Mitchell
Manon Polk	Tekisha Sampson	Jill Sharp
Karima Tayeb	Troy Dale Thompson	Karen Walker

Graduate

J. Bret Miller	Katie Lin Padgett	Abhishek Padiyar
Forrest Clay Thompson		

Congratulations to our Summer 2005 Graduates

Undergraduate

Jennifer Maria Brice	Xuan Jia	Juliana Ilse Leske
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Graduate

Albert W. Collins	Shawn Genung	Karuppuchamy Ramasamy
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From the Department Head's Desk



Dr. Adedeji B. Badiru
Department Head

Dear Alumni and Friends:

This is an exciting time in the history of the department. Several new initiatives have taken place in recent times and more are on the way. We added a new Assistant Professor in the Information Engineering area. Dr. Xueping Li (Ph.D. Arizona State) joined us in June 2005. Also, Dr. Alberto Garcia-Diaz came from Texas A&M University to join the College of Engineering as Associate Dean for Academic Affairs. He is tenured in our department as a Professor of Industrial Engineering.

At the college level, we are experiencing several exciting developments that will bring both direct and indirect benefits to our department. Donations and state government matching have been secured for new engineering buildings on campus. These will be the first new buildings for the college in several decades. The vitality of the college is expected to continue to increase with these new facilities. The brick and mortar developments will have positive ripple effects on our department in terms of space, instructional programs, and collaborative research.

Our Fall faculty retreat took place on August 23 in a historic mansion located in a serene atmosphere in the vicinity of the Smoky Mountains. It was a productive event that led to several new initiatives for faculty

shared governance, teamwork, curriculum issues, and strategic planning process.

On October 12, we had our site visit for Level 1 of the Tennessee Center for Performance Excellence (TNCPE). The exercise gave us important feedback comments toward improving and enhancing departmental focus on quality.

Oh yes, ABET came calling this Fall. Our ABET visit took place October 23-25. Although the final review report has not been received yet, preliminary feedback indicates that we came out of the exercise with only a couple of scratches — no bumps or bruises. We are now back on the continuous path of closing more loops on our curriculum improvement goal. We thank our alumni and friends for joining us in our continuing journey of excellence in teaching, research, and service.

With best regards,

A handwritten signature in black ink that reads "Deji Badiru". The signature is fluid and cursive, with a large initial "D".

Deji Badiru
Professor and Department Head



Fall 2005 Industrial Advisory Board Meeting

The Fall 2005 Industrial Advisory Board Meeting took place on Friday, October 7. Discussions at the meeting centered on several current issues in the department; including Departmental preparations for the October 23-25 ABET visit, IGNITE curriculum enhancement program, updated charter of the Board, undergraduate curriculum flowchart, and student recruitment strategies. Of particular importance was the discussion on how the department can start to offer Six Sigma related programs either as independent offerings or as incorporated segments in present instructional activities. Six Sigma programs have a high level of interest throughout industry and can offer good financial advantages for the department as well as increase the marketability of our graduates. We will continue to explore how our department can undertake this initiative within the prevailing expectations of the college of engineering. Several members of the Board attended the UT-Georgia game on Saturday, October 8; courtesy of complimentary tickets from the UT Development Office.

Recent Book & Journal Publications

- H. Aikens (2006). "Quality: A Corporate Force—Managing for Excellence," Prentice Hall.
- Amer, A. and Sawhney, R., (2005). "A Framework for Minimizing the Simulation Modeling Lead-Time. *Journal of Engineering Systems Simulators*, 2(1/2), 2-11.
- Badiru, Adedeji B., (2006). "Handbook of Industrial & Systems Engineering," CRC Press.
- Y. Kwon, M. K. Jeong, and O. Omitaomu (2005) "Characterization of Closed-Loop Inspection Accuracy Based on the Spindle Probe and CMM," *International Journal of Machine Tools and Manufacture*, 45(12), 1-8.
- M.K. Jeong, J.C. Lu, and N. Wang (2005), "Statistical Process Control Charts for Complicated Functional Data," *International Journal of Production Research*, 43(20), 1-16.
- M.K. Jeong, J.C. Lu, X. Huo, B. Vidakovic, and D. Chen (2005), "Wavelet-based Data Reduction Techniques for Process Fault Detection," *Technometrics*, 47(4), 1-15.
- M.K. Jeong, M. Perry, and C. Zhou, (2005). "Throughput Gain With Parallel Flow in Automated Flow Lines," *IEEE Transactions on Automation Science and Engineering*, 2(1), 84-86.
- J. Fenner, M.K. Jeong, and J.C. Lu (2005). "Optimal Automatic Control of Multistage Production Processes," *IEEE Transactions on Semiconductor Manufacturing*, 18(1), 94-103.
- R. Sawhney and S. Chason (2005). "Human Behavior Based Exploratory Model for Successful Implementation of Lean Enterprise in Industry," *Performance Improvement Quarterly*, 18(2), 76-96.

Recent Research Grants

- Aikens, Hal and Jackson, Denise, "Ignite-A New Paradigm for Curriculum Design & Deployment," National Science Foundation, \$98,538
 - Ding, Fong-Yuen, "Automotive Industry Research Program," Various Sources, \$81,810
 - Halstead, Dave, "Third Party Verification of Football & Baseball Helmets," Riddell, Inc, \$12,000
 - Halstead, Dave, "Third Party Verification of Bicycle Helmets," Giro Sport Design, \$82,621
 - Halstead, Dave, "Biomechanics of Head Impact," Adams USA, Inc., \$48,000
 - Jeong, Myong K., "QoS (Quality of Service) Improvement for High-Speed Networks," ETRI, \$12,000
 - Kong, Dongjoon, "Research Experience with International UG Students," Hanbat National University, \$12,999
 - Sawhney, Rapinder, "Model for Implementing Operational Excellence in the Electronics Industry," Matsushita Electronic Components Corporation of America, \$9,000
 - Sawhney, Rapinder, "Manufacturing Improvement Program," Fluor Enterprises, Inc., \$42,280
 - Sawhney, Rapinder, "Design of Sea Ray Conceptual Plant," Sea Ray Boats Manufacturing Technology, \$10,000
 - Sawhney, Rapinder, "Manufacturing Improvement Program," Fluor Global, \$84,625
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A New Textbook

Quality: A Corporate Force – Managing for Excellence

ISBN 0-13-119757-6

Prentice-Hall, 2006

C. Harold Aikens, Author

Quality: A Corporate Force – Managing for Excellence is a textbook that treats the subject of quality as a driving force that influences virtually every decision and behavior within an organization. Companies cannot simply decide that they want to "do quality" and be successful with their implementations. Quality cannot be an objective by itself - rather it is a consequence of the organization doing a lot of things properly. Excellence will follow because quality principles form the cornerstone of good management practice. Readers who understand this message will have a deeper insight into what ingredients are essential for corporate success. Quality inspired management (QIM) is a term that Dr. Aikens has coined to describe a leadership style that is consistent with a quality-driven enterprise. QIM organizations are: places that encourage continual learning, governed by open-systems thinking, on a path to third-generation quality-maturity, managed by fact, customer responsive, and adaptable to change. The key features of this book include open systems and capability models, a focus on real-world management issues and applications, coverage of process analysis problem-solving and creative tools, coverage of statistical tools and measurement processes, learning objectives and key outcomes, callouts of key terms and key ideas, coverage of the human element and the human resource system, and coverage of senior management issues. Topics are covered that are of interest to all levels of an organization - from the formulation of strategy to the formation of Six Sigma project teams. The textbook is designed to meet a variety of education needs ranging from graduate and undergraduate courses in business and engineering to short-course industrial training.

A New Handbook

Handbook of Industrial & Information Engineering

ISBN: 0849327199

Taylor & Francis CRC Press, 2006

Adedeji B. Badiru, Editor

The Handbook of Industrial & Systems Engineering is the latest addition in the collation of the body of knowledge of industrial and systems engineering. The premise of the handbook is to incorporate more of the systems engineering aspects and expand the breadth of contributing authors beyond the traditional handbooks on industrial engineering. The objective of this book is to provide students, researchers, and practitioners with a comprehensive and easy access to a wide range of industrial and systems engineering tools and techniques in a concise format. The handbook fills the gap that exists between the traditional and modern practice of industrial and systems engineering. Overall Organization of the book is integrative with respect to Quantitative Models, Qualitative Principles, and Computer Techniques. Part I of the book covers general introduction with specific reference to the origin of industrial engineering and the ties to the Industrial Revolution. Part II covers the fundamentals of industrial engineering. Part III covers the fundamentals of systems engineering. Part IV contains chapters on manufacturing and production systems. Part V presents chapters on new technologies. Part VI contains general applications in industrial and systems engineering. Readers will find useful general information in the Appendix, which contains systems conversion factors and formulae.

Sponsor a Bench – Give a Scholarship

We thank our alumni for their continuing support. Our "**Sponsor a Bench—Give a Scholarship**" program is still going on. The program involves naming benches in the department hallway after scholarship donors who make a pledge of at least \$5000. Each sponsored bench carries an inscription of the sponsor's name.

We will appreciate new and continuing participation in this student-centered program. Our "**hall of knowledge**" can use more "benched" names. We call on our alumni to *get benched in the stadium to sponsor a scholarship*. Additional information about the bench sponsorship program can be obtained from Patty Shea, Interim Director of Development for the College of Engineering. She can be contacted at (865) 974-2779 or pwshea@utk.edu.

International Lectures

- **Dr. Dukwon Kim** gave an invited lecture titled "University-Industry Collaboration in US: Today and Tomorrow" at Pohang University of Science and Technology, Korea, July 25, 2005.



Senior Design Projects

The Fall 2005 Senior Design class (IE 422) consists of 9 senior students, with Dr. Robert Ford as the instructor. The following is a snapshot of each project topic.

The clients supporting the Industrial Engineering Program's Senior Capstones are Sea Ray's River-view facility and ARC Automotive. Sea Ray is sponsoring two teams of three students each. The first team consisting of IE Seniors Anant Gandhi (team leader), Michael Anderson, and Nathan Bragg, are assisting Sea Ray engineers to develop plans for the reorganization and redesign of its Fabrication Department. This project team is to assist Sea Ray engineers in determining the work cell layout, storage requirements, customer/supplier relationships, work instructions/job breakdowns, manpower requirements, production listing, and visual schedule/safety/work boards. If time permits, Lean initiatives such as a Kan Ban system are to be included in the project.

The second team of Angela Miller (team leader), Janak Patel, and William Sonnenburg are working on a follow-up project which is to apply 5S to two assembly lines that were recently restructured. Later restructuring will necessitate the relocation of one of these assembly lines. They have been tasked to recommend visual boards for housekeeping, and scheduling; develop plans for efficient storage of tools and materials; provide a detailed layout of the reconfigured assembly lines; identify where additional catwalks or ladders may be needed; and designate areas for all equipment, storage, tools, materials, etc.; all the while keeping their recommendations compatible with the planned relocation of one of these assembly lines.

ARC Automotive is keeping the third team of Elizabeth Woytisek (team leader), Thomas Stegall, and Jonathan Stokes busy assessing the impact of changes that have been made to the driver side inflator assembly line over the last few years. This assessment of these "non-standard" activities is the first to be done since they were implemented. Data will be gathered and analyzed to identify activities that can be discontinued or at least greatly reduced to improve the throughput of this assembly line. Any safety or ergonomic issues observed are to be documented for resolution.



Senior Design Class—IE 422

AROUND and ABOUT THE DEPARTMENT



Amy Basham gets down to serious studying



I&IE Department Booth at Engineers Day – October 2005

Alumnus of Note—Spruell Driver, Jr.

Gov. Phil Bredesen named lobbyist Spruell Driver, Jr. to the University of Tennessee Board of trustees, filling the seat vacated by former Trustee Clayton McWhorter. Driver, 41, is a 1987 IE graduate of our department. He is an attorney with the Nashville law firm of Miller and Martin, which engages in lobbying in addition to its legal work. He is registered to represent nineteen clients in businesses ranging from health care and insurance to telecommunications and distilled spirits. Driver is a past president of the UT National Alumni Association, and currently serves as chairman of the association's annual giving program. Governor Bredesen said, "He has demonstrated a strong commitment to the University of Tennessee educational program, and I'm confident he will play a significant role in advancing Tennessee's priorities for higher education through the UT Board of Trustees." Driver said in a statement that he appreciated the appointment from a governor "determined to help UT reach its fullest potential and become one of the nation's premier public research universities." Our department is proud of the professional accomplishments of Spruell Driver. His several professional roles indicate the diversity and flexibility of industrial engineering education.

Fall 2005 Picnic & Welcome Reception

On September 23, 2005, the department held its annual Welcome Reception. This year's reception, a picnic which took place in Tyson Park, was dedicated to the recognition of the diverse cultures represented by our students, faculty and staff. The event resulted in an excellent turn out of both undergraduate and graduate students as well as many faculty and staff. Thanks to the efforts of some excellent "chefs" within the department, we all shared a multi-cultural feast, with dishes from several different ethnicities, as the faculty and staff welcomed both our new students and returning students. Dr. Adedeji Badiru, in his self-imposed role as event photographer, captured several candid shots during the festivities. More photos are available in the department's scrapbook.



Welcome to Dr. Alberto Garcia-Diaz



Dr. Alberto Garcia-Diaz

Dr. Alberto Garcia, known by his professional name Alberto Garcia-Diaz in the Industrial Engineering and Operations Research community, joined the UT College of Engineering as Associate Dean for Academic Affairs. He is also a full professor in the Department of Industrial and Information Engineering.

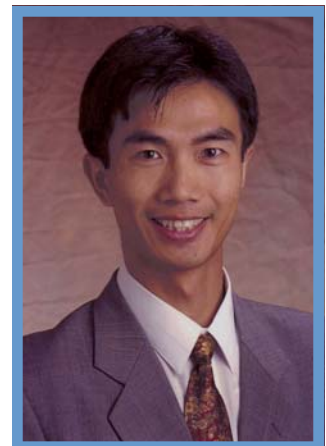
Before joining The University of Tennessee, Dr. Garcia was a professor and Director of Undergraduate Programs for the Department of Industrial Engineering at Texas A & M University. He received his B.S. degree in industrial engineering from the Industrial University of Santander, Colombia, and his M.S. and Ph.D. degrees in industrial engineering from the University

of Illinois at Urbana-Champaign. He has been recognized twice with the prestigious Distinguished Achievement Award for Teaching by the Texas A&M Association of Former Students. He is also a Fellow of the Institute of Industrial Engineers and a licensed Professional Engineer in the State of Texas. Dr. Garcia is the author of four books, including *Facilities Planning and Design*, which will be published this year, as well as numerous journals, proceedings, and technical articles and reports.

Dr. Garcia's technical work during the last 27 years has significantly contributed to the strengthening of the IE role in the area of transportation and distribution planning. A major portion of his work as an academician and researcher emphasizes the systems approach to decision-making concerning the utilization of scarce resources to design cost-effective strategies to maintain, upgrade, and rehabilitate transportation facilities. His knowledge of operations research, decision support systems, and cost and benefit analyses has been integrated in a team approach to investigate a variety of problems requiring the expertise of civil engineers, economists, and industrial engineers. Dr. Garcia has developed a scientific basis to provide effective and efficient solutions to a selected group of transportation problems taking into consideration in each case relevant interconnections of complex and functionally related components and formulating sound modeling strategies and optimization theory.

Welcome to Dr. Xueping Li

Xueping Li joined our department as an Assistant Professor in June 2005. He got his Ph.D. in Industrial Engineering from Arizona State University, Tempe, AZ. He holds a M.S. in Computer Science and a B.S. in Automatic Control from Nankai University, China. His research interests include information systems assurance and quality of service, complex systems modeling, simulation, and optimization, scheduling, applied statistics, web mining, etc. His ongoing research topics include Securing Wireless Sensor Networks, Anomaly Intrusion Detection using Data Mining, and Stable QoS Provision through Non-regular Measure Minimization. He is a member of IEEE and INFORMS.



Dr. Xueping Li

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