

Participants' Profiles

NSF Workshop on Sensing and Prognostics for Scalability of Nanomanufacturing November 2-4, 2009, Northeastern University, Boston, MA

1. First Name: James
Last Name: Benneyan
Nick Name:
Title: Professor
Organization: Northeastern University
Department: Mechanical & Industrial Engineering
Address 1: 334 Snell Engineering Center
Address 2:
City: Boston
State: MA
Zip: 02115
Phone: 6173732975
Email: benneyan@coe.neu.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Process yield and repeatability
Quality and reliability
Planning and control

Research Interests:
Modeling and simulation of nano elements, nano materials, and nano processes
Quality and reliability of nano-and micro-scale devices and system

Briefly describe your research work:
Nanomanufacturing quality, reliability, yield modeling, and risk management models.

Bio:
Short bio

2. First Name: Rebecca
Last Name: Boll
Nick Name:
Title: Operations Manager
Organization: GE Global Research
Department: External Affairs and technology
Address 1: One Research Circle
Address 2:
City: Niskayuna
State: NY
Zip: 12309
Phone: 518-387-7357
Email: boll@ge.com
Website:
Publish Info: Yes
Profession: Industry

Groups of Interest:
Quality and reliability

Research Interests:
Investigation nano materials and their properties

Briefly describe your research work:
My colleague (Paul Buckley) and I will fill in this portion on Monday Nov 2.

Bio:
Operations Manager for External Affairs and Technology for GE Global Research. I look to align GEs efforts in Nano (and other technologies) with Academia and other partners.

3. First Name: Karl
Last Name: Brommer
Nick Name:
Title: Engineering Fellow
Organization: BAE Systems
Department:
Address 1: MER15-2350
Address 2: Box 868
City: Nashua
State: NH
Zip: 03061
Phone: 6038853216
Email: karl.d.brommer@baesystems.com
Website:
Publish Info: Yes
Profession: Industry

Groups of Interest:
Sensing and prognostics

Research Interests:
Nano-sensors and nano-actuators
Integration of functionalities
Nanomanufactured devices for specific applications, energy, medicine, defense

Briefly describe your research work:
I'm interested in very small sensors, including interfaces. I'm also looking at nanometer-scale manufacturing techniques for advanced packaging. Finally, we're interested in nanometer-scale optical sources.

Bio:
Karl Brommer is technical director of the BAE Systems Electronic Systems Innovation Center. His nanotechnology-related interests include advanced electronic packaging methods, nanoscale electronic components, sensors, optical sources and low-power design techniques for nanometer-scale electronics,. He also works with nanoscale metamaterials. Karl was named an engineering fellow at BAE Systems in 2001. Karl earned a PhD in physics from MIT in 1993. At MIT, he published many papers on photonic crystals, especially photonic band structure computations and two-dimensional photonic crystal structures.

4. First Name: Paul
Last Name: Buckley
Nick Name:
Title: Senior Process Chemist
Organization: GE Global Research Center
Department: Chemical Nanotechnologies Laboratory
Address 1: 1 Research Circle
Address 2: 4D-25
City: Niskayuna
State: NY
Zip: 12309
Phone: 518-387-6322
Email: buckleyp@ge.com
Website:
Publish Info: Yes
Profession: Industry

Groups of Interest:
Quality and reliability

Research Interests:
Physics- and chemistry-based fundamental nano research

Investigation of nano processes for production of nano elements
Investigation nano materials and their properties
Modeling and simulation of nano elements, nano materials, and nano processes
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems
Planning and control in nanomanufacturing
Integration of functionalities

Briefly describe your research work:

Currently working on process optimization and scale-up for the preparation of nanoparticles from metal alkoxides and an assortment of organic ligands on the kilogram scale. Current interests include in-process characterization and product quality.

Bio:

Senior process chemist with 3 decades of experience in monomer and polymer development and process transition to commercial plants and toll vendors.

5. First Name: Satish
Last Name: Bukkapatnam
Nick Name: Satish
Title: Professor
Organization: Oklahoma State University
Department: Industrial Engineering and Management
Address 1: EN322
Address 2:
City: Stillwater
State: OK
Zip: 74078
Phone: 405-744-6055
Email: satish.t.bukkapatnam@okstate.edu
Website: <http://www.okstate.edu/commsens>
Publish Info: Yes
Profession: Academia

Groups of Interest:

Sensing and prognostics

Research Interests:

Quality and reliability of nano-and micro-scale devices and system
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems

Briefly describe your research work:

Research addresses sensor-based modeling and monitoring of precision manufacturing processes using methods combining nonlinear dynamics, multi-scale signal analysis and statistics. The research approach has been

recently applied to real-time sensing and control of chemical mechanical planarization process, which is an important process in the microelectronic industry, as well as certain nanomanufacturing processes.

Bio:

Satish T. S. Bukkapatnam received the Ph.D. degree in industrial and manufacturing engineering from Pennsylvania State University, University Park. He is a Professor with the School of Industrial Engineering and Management, Oklahoma State University. His research in sensor-based modeling is a fundamentally new approach to improve quality and performance of manufacturing machines and processes, and other real-world complex systems. These systems include structural systems, the Internet, and a variety of infrastructure systems of interest to IT, transportation, medical, and defense enterprises. This approach is based on augmenting the statistical and intelligent systems foundations of modern monitoring technologies with nonlinear dynamics principles. His research has yielded over 80 peer-reviewed publications (48 in journals), \$2.8M in contracts as PI or Co-PI, and has been the basis for 4 PhD and 8 MS theses. Dr. Bukkapatnam was a recipient of three research paper awards, an Alpha Pi Mu/Omega Rho Outstanding Teacher award, and the SME Dougherty Outstanding Young Manufacturing Engineer Award.

6. First Name: Michael
Last Name: Chandross
Nick Name: Mike
Title: Principal Member of the Technical Staff
Organization: Sandia National Laboratories
Department: Computational Materials Science and Engineering
Address 1: 1515 Eubank Blvd. SE
Address 2:
City: Albuquerque
State: NM
Zip: 87123-0889
Phone: 505-844-5081
Email: mechand@sandia.gov
Website:
Publish Info: Yes
Profession: NationalLab

Groups of Interest:
Process yield and repeatability

Research Interests:
Physics- and chemistry-based fundamental nano research
Investigation nano materials and their properties
Modeling and simulation of nano elements, nano materials, and nano processes

Briefly describe your research work:

Our research aims to expedite bench-top to manufacturing scale-up through enabling predictive modeling and simulation. Our vision of nanomanufacturing necessarily implies practicality, which in turn means processes that have high-throughput and work at large areas and volumes. The step-flash imprint nanolithography process epitomizes these themes, and while our partners at the University of Texas provide the capability, our multiscale algorithms, ranging from molecular through continuum models, will connect the atomistic details to the machine designs. We aim to provide the nanoscale details of defect generation, provide parameter input for finite element models, and work towards massive scale-up to study the long-range order necessary for engineering scales.

Bio:

Michael Chandross has been on the technical staff at Sandia National Laboratories for over 10 years, using state-of-the-art, large-scale, massively parallel simulations to study the aging and reliability of nanomaterials. Prior to joining Sandia he was a National Research Council postdoctoral fellow at SPAWAR San Diego. He holds an M.S. and Ph.D. in physics from the University of Arizona (1996) and a B.S. in physics with electrical engineering from the Massachusetts Institute of Technology (1990). He has co-authored over forty technical publications, and his work has been featured on the cover of Langmuir, JOM and Innovation magazines.

7. First Name: Michelle
Last Name: Chen
Nick Name:
Title: Assistant Professor
Organization: Simmons College
Department: Physics
Address 1: 300 The Fenway
Address 2: Science Building Room 428
City: Boston
State: MA
Zip: 02115
Phone: 617-521-2749
Email: michelle.chen@simmons.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:
Physics- and chemistry-based fundamental nano research
Investigation of assembly processes for the fabrication of nano devices
Investigation nano materials and their properties
Quality and reliability of nano-and micro-scale devices and system
Sensing of nano- and micro-scale process and systems

Nano-sensors and nano-actuators
Integration of functionalities
Nano composites, coatings, nanotubes, nanoparticles
2D Patterning, mask/master fabrication, layer-by-layer assembly
Nanomanufactured devices for specific applications, energy, medicine,
defense
Other nanotechnology related research

Briefly describe your research work:

Michelle Chen has done extensive research on developing specific, sensitive, and reproducible chemical and biological sensors based on functionalized single-walled carbon nanotube field effect transistors. She is experienced in functionalizing carbon nanotubes with DNA, RNA, and proteins, as well as nano/micro fabrication and electrical measurements. She and her colleagues at University of Pennsylvania have electrically detected stimulant to explosives and nerve gases in parts per million concentrations using individual single-walled carbon nanotube devices functionalized with DNA and RNA. In collaboration with Brookhaven National Laboratories she has also electrically detected adenoviruses on human receptor protein functionalized individual single-walled carbon nanotube using ligand-receptor-protein specificity. Toward scaling up, she and her collaborators at Northeastern University and Tufts University have investigated DNA-functionalized carbon nanotubes integrated onto Complementary Metal Oxide Semiconductor Circuitry for chemical detection. Her research in basic components of carbon nanotubes, when combined with advances in large-area dense-array device fabrication and multiplexing circuitry, has potential for high-rate high-volume nano manufacturing for applications in environmental safety, homeland security, and disease diagnostics.

Bio:

Michelle Chen is currently an assistant professor in Physics department at Simmons College in Boston, Massachusetts. She received her PhD in Materials Science and Engineering from University of Pennsylvania, and her MA and BA in physics from The University of Chicago. Her research interest lies in the interdisciplinary intersection among nanotechnology, materials science, physics, and biology. She has done extensive research on developing specific, sensitive, and reproducible chemical and biological sensors based on functionalized single-walled carbon nanotube field effect transistors. At University of Pennsylvania she has electrically detected stimulant to explosives and nerve gas in parts per million concentrations using individual single-walled carbon nanotubes functionalized with DNA and RNA. While collaborating with Brookhaven National Laboratory, she has electrically detected adenoviruses using human receptor protein functionalized carbon nanotubes via ligand-receptor-protein specificity. She has also investigated DNA-functionalized carbon nanotubes integrated on Complementary Metal Oxide Semiconductor Circuitry for chemical detection, with collaborators at Northeastern and Tufts Universities. Michelle has various publications on carbon nanotube sensors, electrical properties of carbon nanotube fibers, quantum Hall effect on organic superconductors and GaAs semiconductors.

She is a member of the Materials Research society, American Physical Society, and American Chemical Society.

8. First Name: David
Last Name: Coit
Nick Name:
Title: Associate Professor
Organization: Rutgers University
Department: Industrial & Systems Engineering
Address 1: 96 Frelinghuysen Rd.
Address 2:
City: Piscataway
State: NJ
Zip: 08854
Phone: 732-445-2033
Email: coit@rutgers.edu
Website: <http://www.rci.rutgers.edu/~coit/>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:
Quality and reliability of nano-and micro-scale devices and system

Briefly describe your research work:

My experience is in system reliability modeling and optimization, and more recently, on newer applications and technologies which have complex manufacturing challenges. I have focused on the integration and simultaneous optimization of manufacturing and process variability and product life. For nano-technology devices, manufacturing and process variability and product life are inherently linked and efforts to estimate or improve reliability must address this interaction. Entirely new perspectives and models are required and these new approaches are being studied and developed.

Bio:

Dr. David W. Coit is an Associate Professor at Rutgers University. His research interests are in the areas of system reliability modeling and optimization, power systems reliability, and multiple-objective optimization. He has been funded for his research from the NSF, U.S. Navy, power utilities and industry. Supported by an NSF grant, he developed algorithms to determine optimal system design configurations considering reliability estimation uncertainty and risk-aversion. Working under a grant from a power utility, Prof. Coit and his students developed reliability importance metrics and optimal transformer replacement policies for that industry. He also previously worked for more than ten years at IIT Research Institute (IITRI), Rome, NY (now called Alion Science and Technology) where he designed and implemented reliability

programs, developed reliability prediction models and conducted reliability analyses.

9. First Name: Tirthankar
Last Name: Dasgupta
Nick Name: Tirtha
Title:
Organization: Harvard University
Department: Statistics
Address 1: 1 Oxford St, Science Center
Address 2: Dept of Statistics
City: Cambridge
State: MA
Zip: 02138
Phone: 617-896-4911
Email: dasgupta@stat.harvard.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:
Investigation of nano processes for production of nano elements
Quality and reliability of nano-and micro-scale devices and system
Other nanotechnology related research

Briefly describe your research work:
Design of Experiments (DOE), statistical and engineering process control, applications of
statistics in nanotechnology, quality engineering and quality management.

Bio:
Tirthankar Dasgupta is an Assistant Professor of Statistics at Harvard University. He completed his PhD in Industrial Engineering from Georgia Institute of Technology, Atlanta. His research interests include Design of Experiments (DOE), statistical and engineering process control, applications of
statistics in nanotechnology, quality engineering and quality management.

He also has eight years of consulting experience in Indian industries and has

dual Master's Degrees in Applied Statistics and Quality, Reliability and Operations Research from the Indian Statistical Institute.

10. First Name: Elsayed
Last Name: Elsayed
Nick Name:
Title: Professor
Organization: Rutgers University
Department: Industrial and Systems Engineering
Address 1: CoRE Building
Address 2: 96 Frelinghuyden Road
City: Piscataway
State: NJ
Zip: 08854
Phone: 7324453859
Email: elsayed@rci.rutgers.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability
Sensing and prognostics

Research Interests:
Quality and reliability of nano-and micro-scale devices and system
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and mciro-scale process and systems
Nano-sensors and nano-actuators

Briefly describe your research work:

Dr. Elsayed has been involved in accelerated life testing since 1987 when he developed a reliability prediction model for the first transatlantic fiber optics cable during his sabbatical at Bell Laboratories. Since then he developed a general accelerated statistics-physics based model to predict reliability at normal operating conditions. During the last ten years he has been extending his work to the degradation modeling area and design of accelerated life testing plans. He has verified his models by conducting extensive accelerated life testing on variety of products using the quality and reliability engineering laboratory at Rutgers.

Bio:

E. A. Elsayed is Professor of the Department of Industrial Engineering, Rutgers University. He is also the Director of the NSF/ Industry/ University Co-operative Research Center for Quality and Reliability Engineering.. His research interests are in the areas of quality and reliability engineering and Production Planning and Control. He is a co-author of Quality Engineering in Production Systems, McGraw Hill Book Company, 1989. He is also the author of Reliability Engineering, Addison-Wesley, 1996. These two books received the 1990 and 1997 IIE Joint Publishers Book-of-the-Year Award respectively.

Dr. Elsayed is also a co-author of Analysis and control of Production Systems, Prentice-Hall, 2nd Edition, 1994. His research has been funded by the DoD, FAA, NSF and industry. Dr. Elsayed has been a consultant for AT&T Bell Laboratories, Ingersoll-Rand, Johnson & Johnson, Personal Products, AT&T Communications , BellCore and other companies. He served as the Editor-in-Chief of the IIE Transactions and the Editor of the IIE Transactions on Quality and Reliability Engineering. Dr. Elsayed is also the Editor of the International Journal of Reliability, Quality and Safety Engineering.

11. First Name: Qianmei
Last Name: Feng
Nick Name: May
Title: Assistant Professor
Organization: University of Houston
Department: Industrial Engineering
Address 1: E217 Engineering Building 2
Address 2:
City: Houston
State: TX
Zip: 77204-4008
Phone: 713-743-2870
Email: qmfeng@uh.edu
Website: <http://www.uh.edu/~qfeng>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:
Quality and reliability of nano-and micro-scale devices and system
Diagnostics and prognostics of nano- and micro-scale processes and systems

Briefly describe your research work:
My research work has been concentrating on developing new integrated quality and reliability models and analysis tools that provide fundamental insights for the successful development and commercialization of many

novel and evolving technologies. Traditional approaches to quality and reliability are inadequate or inappropriate for many recently developed device types and technologies, such as Micro-Electro-Mechanical Systems (MEMS) and biomedical implant devices, because the dimensional tolerances create unique research challenges. Without effective and innovative research on quality and reliability, the continued advancement of many promising technologies may not reach its full potential. The models and optimization approaches resulting from this research will represent fundamental research advancements that may ultimately lead to effective quality and reliability improvement for other developing technologies, such as nano-technology, which has unique manufacturing challenges.

Specifically, I have been working on three interrelated topics: (1) Develop an integrated quantitative methodology to jointly optimize system quality and reliability, (2) Investigate reliability models for multiple failure processes and complex multi-component systems that can be applied to these new devices, and (3) Explore and implement modern concepts of multi-objective optimization for manufacturing and maintenance of these devices. These research topics integrate multidisciplinary research areas: quality and reliability engineering, probability and statistics, multi-objective optimization methods, and system design and manufacturing of evolving devices (e.g., MEMS or NEMS).

The integrated methodology can advance the state-of-the-art on evolving technologies by contributing new concepts, models and algorithms, and also provide timely and effective tools for decision-makers in manufacturing to economically optimize operational decisions for improving reliability, quality and productivity.

Bio:

Qianmei Feng is an Assistant Professor in the Department of Industrial Engineering at the University of Houston, Houston, TX. She received the Ph.D. degree in Industrial Engineering from the University of Washington, Seattle, WA in 2005. She received her Double Bachelor degrees in Mechanical Engineering and Industrial Engineering from Tsinghua University, Beijing, China (1998) with Summa Cum Laude, and her Masters degrees in Management Science from Tsinghua University (2000). She has dedicated her research in the area of system modeling, analysis and optimization in quality and reliability engineering, with applications in airport security, healthcare and manufacturing (especially MEMS, and medical implant devices). She has had a number of research accomplishments with more than 20 publications in refereed journals and conferences within the last four years, such as IIE Transactions, IEEE Transactions on Reliability, Reliability Engineering and System Safety, Computers and Industrial Engineering, and Risk Analysis. Her research has been supported by the Department of Homeland Security (DHS), Texas Department of Transportation, and several internal grants at UH. Currently, she serves as the president for the Division of Quality Control & Reliability Engineering in IIE. She is also a member of INFORMS, ASQ, and Alpha Pi Mu.

12. First Name: Placid
Last Name: Ferreira

Nick Name: Placid
Title: Center Director and Department Head
Organization: Nano-CEMMS
Department: Mechanical Science and Engineering
Address 1: University of Illinois at Urbana-Champaign
Address 2: 1206 W Green Street, MEB, MC-244
City: Urbana
State: IL
Zip: 61801
Phone: (217)-333-0639
Email: pferreir@uiuc.edu
Website: <http://www.nano-cemms.uiuc.edu/>
Publish Info: Yes
Profession: Academia

Groups of Interest:

Research Interests:

Investigation of nano processes for production of nano elements
Investigation of assembly processes for the fabrication of nano devices
Sensing of nano- and micro-scale process and systems
Nano-sensors and nano-actuators
2D Patterning, mask/master fabrication, layer-by-layer assembly
3D active, integrated heterogeneous devices and systems

Briefly describe your research work:

My work addresses the science and engineering of scalable, non-vacuum processes for manufacturing at the nanoscale. It also address the issues of manufacturing tools and infrastructure that go along with this process technology.

Bio:

Dr. Placid M. Ferreira is the Grayce Wicall Gauthier Professor and Head of Mechanical Science and Engineering at Illinois. He is also the director of the Center for Chemical-Electrical-Mechanical Manufacturing Systems (Nano-CEMMS), an NSF-sponsored Nanoscale Science and Engineering Center. He graduated with a PhD in Industrial Engineering from Purdue University in 1987, M.Tech (Mechanical) from IIT Bombay, 1982 and B.E. (Mechanical) for University of Bombay in 1980. Professor Ferreira's research and teaching interests are in the area of industrial automation and include computer-controlled machine-tools and factory systems, nanomanufacturing, and metrology.

13. First Name: Robert
Last Name: Gao
Nick Name:
Title: Pratt & Whitney Chair Professor
Organization: University of Connecticut

Department: Mechanical Engineering
Address 1: UTEB Bldg. Unit 3139
Address 2: 191 Auditorium Road
City: Storrs
State: CT
Zip: 06269
Phone: (860) 486-7110
Email: rgao@engr.uconn.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Sensing and prognostics

Research Interests:
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems
Nano-sensors and nano-actuators
Integration across dimensional scales
Integration of functionalities

Briefly describe your research work:
Research in the Electromechanical Systems Laboratory, directed by Dr. Gao, has focused on developing innovative sensing methodologies and feature extraction techniques to advance the science base for diagnosis and prognosis of manufacturing processes across a wide dimensional scales.

Bio:
Dr. Gao's research expertise and interests are in the areas of physics-based sensing methodology, sensor design and integration, non-stationary signal processing, and energy-efficient sensor networks for the condition monitoring, diagnosis and prognosis of manufacturing equipment and processes, from the macro to micro and nano scales. He served as an Associate Editor of the IEEE Transactions on Instrumentation and Measurement and the ASME Journal of Dynamic Systems, Measurement, and Control, and is currently an Associate Editor of the Journal of Mechatronics, published by the International Federation of Automatic Control (IFAC). He is a co-editor of the book Condition Monitoring and Control for Intelligent Manufacturing, published by Springer in 2006. He is a Fellow of the ASME and IEEE, and a Distinguished Lecturer of the IEEE Electron Devices Society.

14. First Name: Anita
Last Name: Goel
Nick Name:
Title: Dr.
Organization: Nanobiosym
Department: CEO

Address 1: 200 Boston Ave.
Address 2: Suite 4700
City: Medford
State: MA
Zip: 02155
Phone: 781-391-7979
Email: agoel@nanobiosym.com
Website: www.nanobiosym.com
Publish Info: Yes
Profession: Industry

Groups of Interest:

Research Interests:

Briefly describe your research work:

Fundamental Science

Elucidate the physics of living systems, especially at the nanoscale:

 Develop novel conceptual frameworks and theoretical models to describe molecular motors: the dynamics, energy transduction, and coupling to their environment.

 Experimentally probe the single molecule dynamics of molecular machines that read DNA

 Develop nanoscale techniques to precision control nanomachines and harness them for nanomanufacturing.

 Quantum Mechanics: Foundations and its Role in Life.

Applied Science

Develop next--generation nano-enabled platforms for:

 Pathogen detection, including biosensors and biosurveillance systems.

 Nanoscale diagnostic kits for molecular biology and clinical medicine.

 Rapid detection and response capabilities to public health outbreaks like SARS and avian ﬂu.

 Nanobio computing architectures, including quantum information processing by nanomachines.

Energy harvesting, including ultra-efficient nanobio-power generators.

Bio:

Dr. Anita Goel, MD, PhD founded Nanobiosym®, Inc as an R&D engine focusing on emerging technologies at the convergence of Physics, Medicine, and Nanotechnology. Dr. Goel's pioneering contributions to this interface over the past 15 years have been recognized globally by several prestigious honors and awards. Her work on establishing the feasibility of the Gene-RADAR® technology platform at Nanobiosym® has been recognized by multiple rounds of funding from United States Department of Defense agencies including the Defense Advanced Research Projects Agency (DARPA), Air Force Office of Scientific Research (AFOSR); US Dept of Energy (DOE) and US Defense Threat Reduction Agency.

After successfully demonstrating proof-of-concept, Dr. Goel established Nanobiosym® Diagnostics to commercialize nano-enabled portable diagnostic capabilities and realize the full potential for Gene-RADAR® in both developed and emerging world markets.

A Harvard-MIT trained physicist and physician, Dr. Goel was named in 2005 as one of the world's "Top 35 science and technology innovators under the age of 35" by MIT's Technology Review Magazine and in 2006 received the Global Indus Technovator Award from MIT, an honor recognizing the contributions of top leaders working at the forefront of science, technology, and entrepreneurship. Dr. Goel holds a PhD in Physics from Harvard University, an MD from the Harvard-MIT Joint Division of Health Sciences and Technology (HST) and a BS in Physics with Honors & Distinction from Stanford University.

Dr. Goel has been an invited speaker and panelist at numerous conferences and colloquia in the U.S. and abroad. Her recent publications include "Molecular Evolution: a role for quantum mechanics in the dynamics of molecular machines that read DNA," in the book Quantum Aspects of Life and "Harnessing Biological Motors to Engineer Systems for Nanoscale Transport and Assembly" in the August 2008 Nature Nanotechnology.

15. First Name: David
Last Name: He
Nick Name: David
Title: Associate Professor
Organization: University of Illinois at Chicago
Department: Mechanical and Industrial Engineering
Address 1: 842 West Taylor Street
Address 2: ERF 3027

City: Chicago
State: IL
Zip: 60607
Phone: 312-996-3410
Email: davidhe@uic.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability
Sensing and prognostics

Research Interests:
Diagnostics and prognostics of nano- and micro-scale processes and systems

Briefly describe your research work:

My research goal is to develop integrated methodologies and tools using info-computational intelligence for manufacturing and service systems applications such as systems health monitoring, diagnosis and prognosis, condition-based maintenance, reliability modeling and analysis of complex systems, and quality control ranging from macro to nano scale. My research is currently focused on addressing following fundamental and application challenges: (1) Effective computational algorithms and tools that enable existing health monitoring systems to perform advanced prognostics; (2) New and efficient data mining intelligence for diagnostic and prognostic decision-making under uncertainty; (3) New sensing and fault diagnostic techniques for future systems; (4) New methods and tools for reliability monitoring and quality control of modern manufacturing systems.

Bio:

Dr. David He is an Associate Professor and the Director of The Intelligent Systems Modeling & Development Laboratory in the Department of Mechanical & Industrial Engineering at The University of Illinois-Chicago. His research interests include: equipment health monitoring, diagnostics and prognostics, wireless sensor network modeling and analysis, systems reliability modeling and analysis, statistical quality control, manufacturing scheduling.

16. First Name: Mary
Last Name: Herndon
Nick Name: Mary
Title: Sr. Engineer
Organization: Raytheon IDS
Department: Materials Engineering
Address 1: 50 Apple Hill Dr
Address 2:
City: Tewksbury

State: MA
Zip: 01876
Phone: 978-858-5253
Email: Mary_K_Herndon@raytheon.com
Website:
Publish Info: Yes
Profession: Industry

Groups of Interest:
Quality and reliability

Research Interests:
Investigation nano materials and their properties
Nano-sensors and nano-actuators
Nanomanufactured devices for specific applications, energy, medicine, defense

Briefly describe your research work:

I am leading small internal research efforts investigating the use of nano-enhanced materials for military and commercial applications. Specifically, we are looking at the use of functionalized nanofibers for chemical sensing, nano-enhanced conformal coatings of silicone and PTFE for circuit cards, and addition of nanoparticles to liquid coolants to improve heat transfer properties.

Bio:

Mary joined the Materials Engineering Department at Raytheon in 2006. Since then she has been involved in optical characterization development and has been the lead materials engineer on several radar programs. Most recently, she became the lead of the Nanomaterial and Metamaterial IRAD effort for Raytheon IDS.

She spent the 5 years prior to that at Axsun Technologies in Billerica, MA, where she managed the wafer fabrication lab and provided process engineering support for MEMS-based tunable filters and optical fiber feedthroughs for telecommunications applications.

Mary received her Ph.D. in Applied Physics from the Colorado School of Mines. For her thesis work, she designed and implemented a Near-Field Scanning Optical Microscope (NSOM). The NSOM used optical detection of fiber probe dithering to maintain constant probe-sample separation. This provided topographical imaging with ~100nm resolution. Working in conjunction with the Photovoltaics Group at the National Renewable Energy Lab, she used the NSOM generate spatially-resolved photocurrent mapping on polycrystalline solar cell devices. This technique was used to

characterize passivation techniques and grain boundary effects on device performance.

17. First Name: Qiang
Last Name: Huang
Nick Name:
Title: Assistant Professor
Organization: University of Southern California
Department: Industrial and Systems Engineering
Address 1: 3715 McClintock Avenue, GER 240
Address 2:
City: Los Angeles
State: CA
Zip: 90089
Phone: 213-7402433
Email: qiang.huang@usc.edu
Website: <http://www-rcf.usc.edu/~qianghua/>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Process yield and repeatability
Quality and reliability

Research Interests:
Investigation of nano processes for production of nano elements
Investigation nano materials and their properties
Modeling and simulation of nano elements, nano materials, and nano processes
Quality and reliability of nano-and micro-scale devices and system
Diagnostics and prognostics of nano- and micro-scale processes and systems

Briefly describe your research work:
Nanomanufacturing process modeling, analysis, and control

Bio:
Qiang Huang is an Assistant Professor in the Daniel J. Epstein Department of Industrial and Systems Engineering, University of Southern California, Los Angeles. He was an Assistant Professor and then an Associate Professor in the department of Industrial and Management Systems Engineering, University of South Florida, Tampa, from 2003 to 2009. His research focuses on modeling and analysis of complex systems for quality and productivity improvement, with special interest in nanomanufacturing process yield improvement.

18. First Name: Wenzhen
Last Name: Huang
Nick Name: N/A
Title: Assistant Professor

Organization: University of Massachusetts Dartmouth
Department: Mechanical Engineering
Address 1: 285 Old Westport Rd.
Address 2:
City: North Dartmouth
State: MA
Zip: 02747
Phone: 508 910 6568
Email: whuang@umassd.edu
Website:
<http://www.umassd.edu/engineering/mne/people/faculty/huang.cfm>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:
Investigation of nano processes for production of nano elements
Investigation of assembly processes for the fabrication of nano devices
Modeling and simulation of nano elements, nano materials, and nano processes
Quality and reliability of nano-and micro-scale devices and system
Diagnostics and prognostics of nano- and micro-scale processes and systems

Briefly describe your research work:

My research interests are in product and manufacturing process modeling, simulation, design analysis and optimization, and diagnosis for variation reduction and quality improvement. Specific topics in recent and current research include streams of variation modeling and analysis (SOVA) in multi-stage manufacturing systems, compliant assembly process, GD&T modeling and simulation, statistical tolerance analysis and synthesis, probabilistic design and optimization, metrology and Micro/NANO-topography, and statistical signal processing for diagnosis and quality control. The application area covers automotive, fuel cell, MEMS, aerospace, shipbuilding, power industries, and general mechanical products and manufacturing systems design.

Bio:

He received Ph.D. (04) in the department of industrial and system engineering at the University of Wisconsin-Madison, USA. He has received Best Graduate Student Paper Awards by INFORMS Quality, Statistics and Reliability Section in 2002. Recently he has published about 20 articles in Transactions of ASME, IIE, NAMRI/SME, Annals of CIRP, International Journal of Flexible Manufacturing System etc. (see personal website at <http://www.umassd.edu/engineering/mne/people/faculty/huang.cfm>). His recent research has been supported by Advanced Technology Program

(ATP/NIST), National Science Foundation (NSF), and Chancellor's Research Fund from UMASSD.

19. First Name: Cerry
Last Name: Klein
Nick Name:
Title: Program Director
Organization: National Science Foundation
Department: MES
Address 1: 4201 Wilson Blvd
Address 2:
City: Arlington
State: VA
Zip: 22230
Phone: 703-292-5365
Email: cklein@nsf.gov
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:

Research Interests:

Briefly describe your research work:

Do not do research in this area but interested in learning more about it.

Bio:

Cerry Klein is the Program Director for the Service Enterprise Systems program and the Manufacturing Enterprise Systems program at the National Science Foundation. He is also the Lapierre Professor and past chair of the Department of Industrial and Manufacturing Systems Engineering at the University of Missouri. Dr. Klein's research areas include health care, logistics, entrepreneurship, nonlinear and linear integer programming, dynamic programming, network optimization, multi-criteria and multi-attribute decision making, and scheduling. Dr. Klein has also been involved in educational research involving freshman retention and the vertical integration of material, the development of K-12 teacher's expertise in science and mathematics, and the development of introducing entrepreneurship across the engineering curriculum. He has received as a PI or Co-PI funding from several industrial and government institutions including the National Science Foundation, the Office of Naval Research, The Kauffman Foundation, Department of Education, Society of Manufacturing Engineers, McDonnell Douglas, Union Electric, Missouri Department of Transportation, and Unilever.

20. First Name: James
Last Name: Klemic
Nick Name:

Title: Nanotechnology Laboratory Director
Organization: The MITRE Corporation
Department: Emerging and Disruptive Technologies Office
Address 1: 7515 Colshire Drive
Address 2: MS H419
City: McLean
State: VA
Zip: 22102
Phone: 703-983-7713
Email: jklemic@mitre.org
Website:
Publish Info: Yes
Profession: Government

Groups of Interest:

Process yield and repeatability
Quality and reliability

Research Interests:

Physics- and chemistry-based fundamental nano research
Investigation of assembly processes for the fabrication of nano devices
Investigation nano materials and their properties
Quality and reliability of nano-and micro-scale devices and system
Nano-sensors and nano-actuators
Integration across dimensional scales
Nano composites, coatings, nanotubes, nanoparticles
Nanomanufactured devices for specific applications, energy, medicine, defense

Briefly describe your research work:

Relevant current research involves the design, fabrication, testing, and implementation of devices with nanoscale subcomponents for electronics, sensor, and power applications. Additional research into the eventual development of nanoenabled systems: systems based on molecular scale engineering principles. Scaling of nanofabrication processes from lab-based to high-volume manufacturing is key to transition this research work from the laboratory and low unit number applications into large scale applications. Prior related research involved the use of micro and nanofabrication to realize bio-nano devices, high throughput proteomics, microfluidics and MEMS.

Bio:

James F. Klemic is a Scientist and Nanotechnology Laboratory Director at the MITRE Corporation in the Emerging and Disruptive Technologies Office's Nanosystems Group. His current research work includes the use of micro and nanofabrication as well as nanomaterials to realize new architectures for nano-electronics, nanosensors and power applications. In addition to this research work, Jim regularly participates in workshops, review panels, short courses, studies, and collaboration teams on a wide variety of technology topics for the US Government. Prior to joining MITRE in 2007,

he worked for many years at Yale University as a research scientist using micro and nanofabrication for nano-electronics, microfluidics, MEMS, and biosensor applications. At Yale, Jim was also a lecturer teaching courses on microfabrication of MEMS at both the undergraduate and graduate levels. His 21 technical publications have been cited over 1200 times. He has seven US patents issued or pending involving nanofabrication, nanodevices, MEMS, or microfluidics. He has also been involved with two startup companies, one of which, Protometrix, was purchased by Invitrogen (now Life Technologies, NASDAQ: LIFE) in 2004.

21. First Name: Ranga
Last Name: Komanduri
Nick Name:
Title: Professor
Organization: Oklahoma State University
Department: School of Mechanical & Aerospace Engineering
Address 1: 218 Engineering North
Address 2:
City: Stillwater
State: Oklahoma
Zip: 74078-5016
Phone: 405-744-5900
Email: ranga.komanduri@okstate.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Process yield and repeatability
Quality and reliability
Sensing and prognostics
Planning and control
Cost and scale-up issues

Research Interests:
Physics- and chemistry-based fundamental nano research
Investigation of nano processes for production of nano elements
Investigation nano materials and their properties
Modeling and simulation of nano elements, nano materials, and nano processes
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems
Planning and control in nanomanufacturing
Nano composites, coatings, nanotubes, nanoparticles

Briefly describe your research work:
Expertise in sensors for monitoring and control of finishing processes

Synthesis and characterization of CNT composites for MEMS structural applications

MD simulations of nanometric cutting, materials properties, and tribology

Scaling laws from atomistic to continuum via mesoplasticity

Bio:

Dr. Ranga Komanduri is a Regents Professor and A. H. Nelson, Jr. Endowed Chair in Engineering in the School of Mechanical and Aerospace Engineering, Oklahoma State University, Stillwater, OK. He joined OSU in 1989. Dr. Komanduri earned his B.E. (Mechanical) and M.E. (Heat Power Engineering) from Osmania University, Hyderabad, Andhra Pradesh, India. He earned his Ph.D. (1972) and D. Eng. (1992) from Monash University, Melbourne, Australia. Dr. Komanduri's research interests are focused on advanced manufacturing processes and materials. At OSU, he developed a state-of-the-art research laboratory in this area, which is located in the newly built Advanced Technology Research Center (ATRC) at OSU. His research activities at OSU include finishing of advanced ceramics for ball and roller bearing applications; hard, wear-resistant coatings on cutting tools, including low-pressure diamond coatings on cutting tools and multiple nanocoatings on cutting tools; molecular dynamics (MD) and Monte Carlo (MC) simulations of nanometric cutting and tribology; development of ab initio potential energy surfaces; thermal aspects of various manufacturing processes, including polishing, machining, welding, heat treatment, and tribology; laser assisted material processing; Scaling laws for material processing and material properties from atomistic to continuum; chemical mechanical polishing (CMP) of semiconductor materials; synthesis and application of aligned carbon nanotubes (CNT); mechanics of particulate materials; scaling laws from atomistic to continuum; and EKG signal analysis for cardiological disorders. He published some 230 technical papers including several chapters in Encyclopedias and other specialized books, 22 Editorship of Conference Proceedings, and 22 patents. He has delivered several keynote papers at various national and international conferences and has delivered lectures at various universities and industry throughout the world. He interacts extensively with leading researchers from various countries. His research has been supported by NSF, Department of Defense (DARPA, DEPSCoR, Army, Navy, AirForce), EPA, OSU's University Center for Energy Research (UCER), and industry.

22. First Name: Zhenyu
Last Name: Kong
Nick Name: James
Title: Assistant Professor
Organization: Oklahoma State University
Department: Industrial Engineering and Management
Address 1: 322 Engineering North
Address 2:
City: Stillwater
State: OK
Zip: 74074

Phone: 405-744-9698
Email: james.kong@okstate.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Sensing and prognostics

Research Interests:
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems

Briefly describe your research work:
Automated quality control for (1) multistage manufacturing systems and (2) micro/nano manufacturing processes using sensor information.

Bio:
Academic Qualifications

- Ph.D., Industrial and Systems Engineering, University of Wisconsin-Madison, July, 2004
- M.S., Mechanical Engineering, Harbin Institute of Technology, Harbin, China, March, 1995
- B.S., Mechanical Engineering, Harbin Institute of Technology, Harbin, China, July, 1993

Professional Experiences

- Assistant Professor, School of Industrial Engineering and Management, Oklahoma State University, 08/2006 - present
- Senior Research Engineer, Dimensional Control Systems, Troy, Michigan, 07/2004-07/2006
- Research Assistant, University of Wisconsin-Madison, 09/2000 - 07/2004
- Research Associate, University of Michigan-Ann Arbor, 11/1998 - 09/2000

23. First Name: Bruce
Last Name: Kramer

Nick Name:
Title: Senior Advisor
Organization: NSF
Department:
Address 1: 4201 Wilson Blvd.
Address 2:
City: Arlington
State: VA
Zip: 22230
Phone: 7032925348
Email: bkramer@nsf.gov
Website:
Publish Info: Yes
Profession: Government

Groups of Interest:
Cost and scale-up issues

Research Interests:
Other nanotechnology related research

Briefly describe your research work:
Funding of nanoscale and interdisciplinary research.

Bio:
BRUCE M. KRAMER is a graduate of the Massachusetts Institute of Technology (S.B., S.M. 1972, Ph.D. 1979). He has served on the faculties of MIT and George Washington University and is currently Senior Advisor for Engineering in the Division of Civil, Mechanical and Manufacturing Innovation at the National Science Foundation, where he directs Interdisciplinary and Cross-Directorate Programs.

Dr. Kramer co-founded and was Director of Engineering of Zoom Technologies, Inc. of Boston, Massachusetts, a NASDAQ company and leading producer of modems and wireless networking products marketed under the Zoom, Hayes, Practical Peripherals, Global Village and Cardinal brands.

He is a Fellow of the School of Engineering of the University of Tokyo and has been awarded the F.W. Taylor Medal of the International Institution for Production Engineering Research, the Blackall Award of the American Society of Mechanical Engineers, the R.F. Bunshah Medal of the International Conference on Metallurgical Coatings, and the Distinguished Service Award of the NSF, the highest honorary award granted by the Foundation.

24. First Name: Soundar
Last Name: Kumara
Nick Name: Soundar
Title: Allen, E& Allen, M., Pearce Professor of IE
Organization: Penn State
Department: Industrial Engineering
Address 1: 310 Leonhard Building
Address 2:
City: University Park
State: PA
Zip: 16802
Phone: 814.863.2359
Email: skumara@psu.edu
Website: <http://www2.ie.psu.edu/Kumara/Personal/Kumara.htm>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Sensing and prognostics

Research Interests:
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems
Integration across dimensional scales

Briefly describe your research work:

Our group is active in sensing, sensor signal representation and prognosis. We study the nonlinear signatures, characterize them and use the features for state estimation. Our work uses Chaos theory, wavelets and statistical pattern recognition as guiding scientific foundations to study sensing. In addition we try to propagate these signals to multi-scales and study the emerging networks to make inferences at multi-levels and multi-scales.

Bio:

SOUNDAR KUMARA is a Pearce Chaired Professor of Industrial and Manufacturing Engineering. He holds joint appointments with the department of Computer Science and Engineering and School of Information Sciences and Technology at the Pennsylvania State University. He also holds an adjunct position with the C.R. Rao Institute of Mathematics, Statistics and Computer Science at University of Hyderabad, India. His research interests are in: Web Services, Sensing, and Complexity as applied to systems monitoring, diagnosis and prognostics. He is an elected fellow of the International Academy of Production Research (CIRP), and a Fellow of Institution of Industrial Engineers. He has won several awards including the PSU College of Engineering Premier Research Award and the Penn State Faculty Scholar Medal (First PSU IE faculty ever to win any of these two awards). He and his students have won several best paper awards in several conferences, and awards at IEEE sponsored Web Services software platform development competitions.

25. First Name: Yue
Last Name: Kuo
Nick Name:
Title: Professor
Organization: Texas A&M University
Department: Thin Film Nano & Microelectronics Research Laborat
Address 1: 235 J. E. Brown Engineering Bldg.
Address 2: TAMS, MS 3122
City: College Station
State: Texas
Zip: 7784303122
Phone: 979-845-9807
Email: yuekuo@tamu.edu
Website: <http://yuekuo.tamu.edu>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Process yield and repeatability

Research Interests:
Physics- and chemistry-based fundamental nano research
Investigation of nano processes for production of nano elements
Investigation nano materials and their properties
Quality and reliability of nano-and micro-scale devices and system
Integration across dimensional scales
Nanomanufactured devices for specific applications, energy, medicine, defense
Other nanotechnology related research

Briefly describe your research work:
My research areas are nano device fabrication processes, reliability, etc.
The industry that I have been closely involved are ULSI and thin film transistor liquid crystal displays. This includes thin films, plasmas, solid state transistors, large-area flat panel displays, lifetime, etc.

Bio:
Yue Kuo is Dow Professor who established the Thin Film Nano & Microelectronics Research Laboratory since joined Texas A&M University in 1998. Previously, he spent near 2 decades in IBM T. J. Watson Research Center and Silicon Valley. He obtained PhD from Columbia University.

Prof. Kuo's research is focused on thin film materials, processes, and devices of TFTs and ULSICs. He is one of the few researchers who have been deeply involved in both industry and academic research, development, and mass production of TFT LCDs since the early stage. Many of his research

results have been included in industry products and routinely used in research labs.

Prof. Kuo's honors include: ECS Electronics and Photonics Award, IEEE Fellow, ECS Fellow, TEES Fellow, IBM technology and invention awards, honorary Professor of Nankai University and Xian Jiaotong University, 110 plenary/keynote/ invited speeches, etc. He is credited for 350 papers, 5 books, 3 journals and magazines, 14 conference proceedings, and 40 inventions. In addition to organizing and chairing of 50 international conferences, he has served on numerous advisory and review boards, panels, and committees for US National Academies of Science and Engineering, industry, universities, and governments in many countries and areas. He has consulted for many global semiconductor companies.

26. First Name: Yue
Last Name: Kuo
Nick Name:
Title: Professor
Organization: Texas A&M University
Department: Thin Film Nano & Microelectronics Research Laborat
Address 1: 235 J. E. Brown Engineering Bldg.
Address 2: TAMS, MS 3122
City: College Station
State: Texas
Zip: 7784303122
Phone: 979-845-9807
Email: yuekuo@tamu.edu
Website: <http://yuekuo.tamu.edu>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Process yield and repeatability

Research Interests:
Physics- and chemistry-based fundamental nano research
Investigation of nano processes for production of nano elements
Investigation nano materials and their properties
Quality and reliability of nano-and micro-scale devices and system
Integration across dimensional scales
Nanomanufactured devices for specific applications, energy, medicine, defense
Other nanotechnology related research

Briefly describe your research work:
My research areas are nano device fabrication processes, reliability, etc.
The industry that I have been closely involved are ULSI and thin film

transistor liquid crystal displays. This includes thin films, plasmas, solid state transistors, large-area flat panel displays, lifetime, etc.

Bio:

Yue Kuo is Dow Professor who established the Thin Film Nano & Microelectronics Research Laboratory since joined Texas A&M University in 1998. Previously, he spent near 2 decades in IBM T. J. Watson Research Center and Silicon Valley. He obtained PhD from Columbia University.

Prof. Kuo's research is focused on thin film materials, processes, and devices of TFTs and ULSICs. He is one of the few researchers who have been deeply involved in both industry and academic research, development, and mass production of TFT LCDs since the early stage. Many of his research results have been included in industry products and routinely used in research labs.

Prof. Kuo's honors include: ECS Electronics and Photonics Award, IEEE Fellow, ECS Fellow, TEES Fellow, IBM technology and invention awards, honorary Professor of Nankai University and Xian Jiaotong University, 110 plenary/keynote/ invited speeches, etc. He is credited for 350 papers, 5 books, 3 journals and magazines, 14 conference proceedings, and 40 inventions. In addition to organizing and chairing of 50 international conferences, he has served on numerous advisory and review boards, panels, and committees for US National Academies of Science and Engineering, industry, universities, and governments in many countries and areas. He has consulted for many global semiconductor companies.

27. First Name: Paul
Last Name: Kvam
Nick Name: Paul
Title: Professor
Organization: Georgia Tech
Department: School of Industrial and Systems Engineering
Address 1: 755 Ferst Drive
Address 2:
City: Atlanta
State: GA
Zip: 30332-0205
Phone: 404-894-6515
Email: pkvam@isye.gatech.edu
Website: <http://www2.isye.gatech.edu/~pkvam/>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:

Quality and reliability of nano-and micro-scale devices and system

Briefly describe your research work:

Analysis of reliability data for nano manufacturing processes.

Bio:

Paul Kvam is an associate professor in ISyE. He joined ISyE in 1995 after working for four years as scientific staff at the Los Alamos National Laboratory. Dr. Kvam received his B.S. in Mathematics from Iowa State University in 1984, an M.S. in Statistics from the University of Florida in 1986, and his Ph.D. in Statistics from the University of California, Davis in 1991. He has published over 70 articles in peer-reviewed journals in statistics and engineering, and is a fellow of the American Statistical Association.

His research interests focus on statistical reliability with applications to engineering, nonparametric estimation, and analysis of complex and dependent systems. Dr. Kvam has served as associate editor for IEEE Transactions on Reliability (1992-2000), Technometrics (1999-2005), The American Statistician (2005-present) and Journal of the American Statistical Association (2002-present). He is a member of the American Statistical Association, Institute of Mathematical Statistics, Institute for Operations Research and Management Science, IEEE.

28. First Name: Haitao
Last Name: Liao
Nick Name: Haitao
Title: Assistant Professor
Organization: University of Tennessee
Department: Nuclear Eng./ Industrial & Information Eng.
Address 1: 211 Pasqua Building
Address 2: University of Tennessee
City: Knoxville
State: TN
Zip: 37996
Phone: (865) 974-0984
Email: hliao4@utk.edu
Website: <http://web.utk.edu/~hliao4>
Publish Info: Yes
Profession: Academia

Groups of Interest:

Quality and reliability

Research Interests:

Quality and reliability of nano-and micro-scale devices and system
Nano composites, coatings, nanotubes, nanoparticles

Briefly describe your research work:

Dr. Liao's recent research is focused on the design of equivalent accelerated testing plans to improve the statistical estimation precision and economic performance of such experiments. His group is also conducting a collaborative research on degradation modeling of nano composites.

Bio:

Dr. Haitao Liao holds a joint Assistant Professor position in Industrial & Information Engineering Department and Nuclear Engineering Department at the University of Tennessee, Knoxville. His research focuses on Reliability and Maintainability Engineering, Probabilistic Risk Assessment, Applied Statistics, Operations Research, and Artificial Intelligence. His work has been published in Naval Research Logistics, European Journal of Operational Research, IIE Transactions, IEEE Transactions on Reliability, Reliability Engineering & System Safety, and International Journal of Production Research, and others. Currently, he serves as Assistant Area Editor of Computer & Industrial Engineering for Statistics, Quality, Reliability & Maintenance. His research has been supported by NSF, DOE, Hong Kong Research Grant Council, and industrial partners such as Cessna Aircraft and Boeing. His research group is conducting fundamental and applied research in accelerated testing, condition monitoring and maintenance, risk-informed decision making, and uncertainty reduction in life cycle reliability and logistics for high value products such as wind turbine systems and equipment of nuclear power plants.

29. First Name: Yingzi
Last Name: Lin
Nick Name:
Title: Assistant Professor
Organization: Northeastern University
Department: Mechanical and Industrial Engineering
Address 1: 334 Snell Engineering
Address 2: 360 Huntington Ave.
City: Boston
State: MA
Zip: 02115
Phone: 617.373.8610
Email: yilin@coe.neu.edu
Website: <http://www.coe.neu.edu/~yilin>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Sensing and prognostics

Research Interests:
Nano-sensors and nano-actuators

Briefly describe your research work:
Area of expertise includes: driver-vehicle systems, human-centered intelligent machine systems, non-intrusive sensor development, multimodality information fusion for inferring human state and emotion, human machine interface design, and human friendly mechatronics.

Bio:
Dr. Yingzi Lin is an Assistant Professor with the Department of Mechanical and Industrial Engineering, Northeastern University, Boston, where she directs the Intelligent Human-Machine Systems Laboratory and co-directs the Virtual Environments Laboratory. She was on the faculty of Concordia Institute for Information Systems Engineering at Concordia University (Montreal) during 2004-2005. She received a Ph.D. in Mechanical Engineering from the University of Saskatchewan in 2003, and another Ph.D. in Vehicle Engineering from China Agricultural University (Beijing, China) in 1997. Her area of expertise includes: driver-vehicle systems, human-centered intelligent machine systems, non-intrusive sensor development, multimodality information fusion for inferring human state and emotion, human machine interface design, and human friendly mechatronics, where she has published over 70 technical papers in referred journals and conferences. She is the Chair of the Virtual Environments Technical Group of the Human Factors and Ergonomics Society (HFES) and is appointed to two committees of the Transportation Research Board (TRB) of the National Academy of Sciences: Vehicle User Characteristics (AND10), and Simulation and Measurement of Vehicle and Operator Performance (AND30). She is an Associate Editor of the IEEE Transactions on Systems, Man and Cybernetics - Part A (IEEE-SMC A), and ASME Dynamic Systems and Controls Editorial Board.

30. First Name: Jye-Chyi (JC)
Last Name: Lu
Nick Name: JC
Title: Professor
Organization: Georgia Institute of Technology
Department: School of Industrial and Systems Engineering
Address 1: 765 Ferst Drive
Address 2:
City: Atlanta
State: GA
Zip: 30332
Phone: 770-622-2140
Email: jclu@isye.gatech.edu
Website: www.isye.gatech.edu/~jclu
Publish Info: Yes
Profession: Academia

Groups of Interest:

Quality and reliability

Research Interests:

Investigation of nano processes for production of nano elements
Quality and reliability of nano-and micro-scale devices and system

Briefly describe your research work:

Quality, statistics and reliability in nano-manufacturing

Bio:

Dr. Jye-Chyi Lu received his Ph.D. degree in statistics in 1988 at the University of Wisconsin and was a professor in the Department of Statistics at North Carolina State University from 1988 to 1999. Now, he is a professor in the School of Industrial and Systems Engineering at Georgia Institute of Technology. Dr. Lu's has about 60 disciplinary and interdisciplinary publications appeared in both engineering and statistics journals. Currently, he is the Editor-in-Chief for the International Journal of Quality, Statistics and Reliability (IJQSR) and an Associate Editor for IEEE Transactions on Reliability and Journal of Quality Technology. His research areas cover reliability, industrial statistics, signal processing, semiconductor and electronic manufacturing, data mining and a few new topics such as supply-chain management, logistics planning and nanotechnology.

31. First Name: John
Last Name: Maguire
Nick Name:
Title: Dr.
Organization: Air Force Research Laboratory
Department: Manufacturing Technology
Address 1: Bldg 653, Rm 207
Address 2: 2977 Hobson Way
City: Dayton
State: Ohio
Zip: 45433-7750
Phone: 937 830 1005
Email: john.maguire@wpafb.af.mil
Website:
Publish Info: Yes
Profession: Government

Groups of Interest:

Cost and scale-up issues

Research Interests:

Physics- and chemistry-based fundamental nano research
Investigation of assembly processes for the fabrication of nano devices

Modeling and simulation of nano elements, nano materials, and nano processes
Sensing of nano- and micro-scale process and systems

Briefly describe your research work:

My work focuses on the development and integration of computational models and in-situ sensors with closed-loop adaptive process control. The work relates to scale-up of nanomanufacturing and is of relevance to this workshop in two areas;

* Process Modeling; the development of new theoretical techniques that enable accurate prediction of the thermodynamic and transport properties (phase diagrams, self assembly/structure and transport properties) of nanomaterials.

* Sensors; the development of light-scattering-based sensors (Raman, Rayleigh and Brillouin) to measure the in-situ chemical, mechanical, and thermal properties at the nanoscale.

The ability to predict, sense and control nanostructure structure over macroscopic distance scales is critical to high-volume, high-rate, high-quality nanomanufacturing.

Bio:

John Maguire leads the Integrated Product Team for Nanomanufacturing at the Air Force Research Laboratory, Materials and Manufacturing Directorate. He has held senior positions in academia, industry, and government and directed both experimental and theoretical research probing soft and interfacial matter in the mesoscopic regime. He has a DPhil (physical chemistry, 1976) from the University of Ulster (UK), is a Fellow of the Royal Society of Chemistry (FRSC), a Fellow of the Society of Manufacturing Engineers (FSME) and in 2004 earned a higher doctorate (D.Sc.) in recognition of his contributions to materials science and engineering.

32. First Name: Joey
Last Name: Mead
Nick Name:
Title: Professor
Organization: University of Massachusetts Lowell
Department: Plastics Engineering
Address 1: 1 University Avenue
Address 2:
City: Lowell
State: MA
Zip: 01854
Phone: 978-934-3446

Email: Joey_Mead@uml.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:
Cost and scale-up issues

Research Interests:
Investigation of assembly processes for the fabrication of nano devices
Investigation nano materials and their properties
Nano composites, coatings, nanotubes, nanoparticles
2D Patterning, mask/master fabrication, layer-by-layer assembly

Briefly describe your research work:
Nanomanufacturing of polymers. Template directed assembly of polymer blends at high rates. Directed assembly and transfer of polymers. Multilayer extrusion of polymer films. Electrospinning of polymer blends and elastomers. Mixing and dispersion of nanofillers in polymers using commercial processes, such as twin screw compounding

Bio:
Professor of Plastics Engineering. Deputy Director of the NSF Center for High-rate Nanomanufacturing. Have worked at the Univ. of Massachusetts Lowell for over 10 years. Prior experience as Materials Engineer at the US Army Research Laboratory in Watertown, MA (Composites Development Branch)for 11 years. Ph.D. in Polymers from MIT, SB in Chemistry MIT.

33. First Name: Emanuel
Last Name: Melachrinoudis
Nick Name: Manny
Title: Director of Industrial Engineering
Organization: Northeastern University
Department: Mechanical and Industrial Engineering
Address 1: 360 Huntington Avenue
Address 2:
City: Boston
State: MA
Zip: 02115
Phone: 617-373-4850
Email: emelas@coe.neu.edu
Website: www.coe.neu.edu/~emelas
Publish Info: Yes
Profession: Academia

Groups of Interest:
Planning and control

Research Interests:

Briefly describe your research work:

I haven't done any work related to nano but I hope I learn and do in the future.

Bio:

Professor Melachrinoudis received an undergraduate Diploma in Mechanical and Electrical Engineering from the National Technical University of Athens, Greece. Threafter, he worked for 6 years at Hellenic Cables Inc. in various positions as production engineer of synthetic rubber and plastic cables and quality control engineer. He received an MBA from The University of Massachusetts, Amherst, and a Ph.D. in Industrial Engineering and Operations Research. He is a Certified Manufacturing Engineer (CMfgE). For the last thirty years he is a Professor at Northeastern University. For the last five years he is the Director of Industrial Engineering and Associate Chair of the Department of Mechanical and Industrial Engineering at Northeastern University. His research interests are in mathematical modeling and optimization with applications to supply chain networks, telecommunication networks, facility location and healthcare. He has published over 60 refereed journal publications and has been funded by the Maine Forest Service, Army Research Office, UPS, and Department of Transportation.

34. First Name: Thomas
Last Name: Mooney
Nick Name: Tom
Title: Principal Engineer
Organization: General Electric
Department: Advanced Technology Operations
Address 1: 1000 Western Ave
Address 2:
City: Lynn
State: MA
Zip: 01910
Phone: 781-594-9622
Email: thomas.mooney@ge.com
Website:
Publish Info: Yes
Profession: Industry

Groups of Interest:

Sensing and prognostics

Research Interests:

Nanomanufactured devices for specific applications, energy, medicine, defense

Briefly describe your research work:
Developing requirements for sensing technologies.

Bio:

Thomas D. Mooney is a Principal Engineer in the Advanced Technology Operation at GE-Aviation, Lynn, MA. Mr. Mooney is responsible for developing PHM/CBM+ technologies and is a member of GE-Aviation's Prognostics and Health Management Design Board. He is currently responsible for managing PHM programs for the T700, GE38, GE3000 and F414 engine lines.

Prior to his role in the Advanced Technology Operation, Mr. Mooney was a Principal Engineer in System Safety. He led the System Safety/ Flight Safety team for the GE-Aviation Lynn site. He chaired the Safety Program Management Team (SPMT) for the F414 engine program and served as the propulsion representative on the USN's F/A-18E/F System Safety Working Group.

Mr. Mooney has over 30 years of experience at GE-Aviation having held various positions in design, project, system safety and engine test facility design. He has a B.S. in Mechanical Engineering from University of Massachusetts, Amherst, and M.S. in Engineering from Northeastern University in Boston, MA.

35. First Name: Jeffrey
Last Name: Morse
Nick Name: Jeff
Title: Managing Director
Organization: National Nanomanufacturing Network
Department:
Address 1: 710 N. Pleasant St
Address 2: 322 LGRT
City: Amherst
State: MA
Zip: 01003
Phone: (413)545-5264
Email: jdmorse@research.umass.edu
Website: www.internano.org
Publish Info: Yes
Profession: Academia

Groups of Interest:
Cost and scale-up issues

Research Interests:

Investigation of nano processes for production of nano elements

Briefly describe your research work:

Nanomanufacturing issues

Bio:

Jeff Morse is the Managing Director of the National Nanomanufacturing Network, a new organization sponsored by the National Science Foundation through the Center for Hierarchical Manufacturing, at the University of Massachusetts, Amherst. Previously, Jeff was a Senior Scientist in the Center for Micro and Nano Technology at Lawrence Livermore National Laboratory. He received his BS (1983) and MS (1985) Degrees in Electrical Engineering from the University of Massachusetts, and a PhD (1992) in Electrical Engineering from Stanford University. His interests and expertise includes semiconductor devices and physics, advanced micro/nanofabrication processes, microelectromechanical systems (MEMS), and microfluidics. As a result, he has been a frequent invited speaker at prestigious meetings on the subject including the annual Fuel Cell Meeting and the Knowledge Foundation's Small Fuel Cell Conference. In addition to numerous journal and conference publications, Dr. Morse holds 10 patents in the area of micro-fuel cells, which have served as the basis of Ultracell, Corp, a leading company in integrated micro methanol fuel processor/proton exchange fuel cell systems, and Lilliputian Systems, Inc., a leader in the development of MEMS-Based Solid Oxide Fuel Cells for portable power applications.

36. First Name: Chiwoo
Last Name: Park
Nick Name: Chiwoo
Title: Ph.D. Candidate
Organization: Texas A&M University
Department: Industrial and Systems Engineering
Address 1: 3131 TAMU
Address 2:
City: COLLEGE STATION
State: Texas
Zip: 77843-3131
Phone: 979-224-3667
Email: chiwoo.park@gmail.com
Website: <http://people.tamu.edu/~chiwoo.park>
Publish Info: Yes
Profession: Academia

Groups of Interest:

Quality and reliability

Sensing and prognostics

Research Interests:

Quality and reliability of nano-and micro-scale devices and system

Diagnostics and prognostics of nano- and micro-scale processes and systems

Nano composites, coatings, nanotubes, nanoparticles

Briefly describe your research work:

My research group is working on the characterization of nano-materials. The characterization is essential for evaluating the quality of the current nano-material synthesis process, but it requires a lot of time-consuming works. We are trying to automate the characterization process.

Bio:

I am a Ph.D. student in Texas A&M University, majoring in Industrial and Systems Engineering. My research is in the area of quality engineering, applied statistics and machine learning, with the engineering applications for nano-characterization, sensor network and smart infrastructure.

37. First Name: Kamlakar
Last Name: Rajurkar
Nick Name: Raju
Title: Distinguished Professor of Engineering
Organization: University of Nebraska-Lincoln
Department: IMSE Dept.
Address 1: 175 NH
Address 2:
City: Lincoln
State: NE
Zip: 68588-0518
Phone: 402-472-0454
Email: krajurkarl@unl.edu
Website:
Publish Info: Yes
Profession: Academia

Groups of Interest:

Cost and scale-up issues

Research Interests:

Physics- and chemistry-based fundamental nano research
Investigation of nano processes for production of nano elements
Modeling and simulation of nano elements, nano materials, and nano processes
Quality and reliability of nano-and micro-scale devices and system
Sensing of nano- and micro-scale process and systems
Planning and control in nanomanufacturing
Integration across dimensional scales
Nanomanufactured devices for specific applications, energy, medicine, defense
Other nanotechnology related research

Briefly describe your research work:

Research and development of micro and nano machining processes with emphasis on process capabilities, mechanisms, modeling, process-material interaction, sensing and control and quality and applications.

Bio:

K.P. Rajurkar, Distinguished Professor of Engineering at the College of Engineering University of Nebraska-Lincoln, is the founder and Director of the Center for Nontraditional Manufacturing Research and Professor of Industrial and Management Systems Engineering. He served as the interim Chair of the Industrial and Management Systems Engineering department (January 2007 - December 2008). He has also served as the Interim Associate Dean for Research of the College of Engineering (January 2005-December 2006). He served as Program Director of Manufacturing Machines and Equipment at the National Science Foundation (September 1999- November 2002). Dr. Rajurkar is a Fellow of ASME, SME and International Academy for Production Engineering. He also served as the ASME Manufacturing Technical Group Leader (previously called Vice President-Manufacturing) for three years (2005-2008). Dr. Rajurkar has more than 120 refereed publications and nearly 120 technically edited papers which were published in conference proceedings. His research in macro, micro and nano scale machining has been supported by NSF, NIST/ATP, DoD, GEAE, Extrude Hone, Brush Wellman, Cummins Engines, NCMS, Mitsubishi Electric Corporation (Japan), Trans Tec Inc. (England), State of Nebraska, and other sponsors. He has received the ASME Blackall Machine Tool and Gage Award for a paper on Pulse Electrochemical Machining. He has received the 2005 Charles F. Carter Jr. Advancing Manufacturing Award from the Association of Manufacturing Technology. Recently he has received 2009 International Honor, Gold Medal from the Society of Manufacturing Engineers. He is a co-inventor of a U.S. patent on cryogenically cooled tool machining.

38. First Name: Henning
Last Name: Richter
Nick Name:
Title: Dr.
Organization: Nano-C, Inc.
Department:
Address 1: 33 Southwest Park
Address 2:
City: Westwood
State: MA
Zip: 02090
Phone: 781-407-9417 x228
Email: hrichter@nano-c.com
Website: www.nano-c.com
Publish Info: Yes
Profession: Industry

Groups of Interest:
Cost and scale-up issues

Research Interests:

Physics- and chemistry-based fundamental nano research
Investigation nano materials and their properties
Planning and control in nanomanufacturing
Integration across dimensional scales
Integration of functionalities
Nano composites, coatings, nanotubes, nanoparticles

Briefly describe your research work:

Nano-C is in the process to become a major manufacturer of carbonaceous nanomaterials. It has been further developing a combustion process allowing for the selective synthesis of either fullerenes (C₆₀, C₇₀, ..., C₈₄, ...) or single-walled carbon nanotubes (SWCNT). Scale-up has been demonstrated successfully. We are working on the chemical functionalization of fullerenes changing the solubility in selected solvents and their electronic structure. Properties are optimized in view of applications such as their use as electron-acceptors in organic photovoltaic (OPV) devices. As SWCNT are not well defined molecules but complex materials, we have been emphasizing on their detailed characterization using a large range of spectroscopic and microscopy techniques. Correlations of properties such as length and parameters of the manufacturing process have been established. Nano-C has been developing dispersion technology suitable for a range of solvents allowing for their use in a variety of applications.

Bio:

Dr. Henning Richter Director of Materials Synthesis Research at Nano-C and also Research Affiliate at M.I.T., has been working on flame synthesis of fullerenes and carbon nanotubes for more than 15 years. In interaction with Prof. Strano, he will be responsible for the planning and conduction of the proposed work. Before coming to M.I.T., he designed and built combustion equipment for fullerene synthesis at Namur University in Belgium. He led the publication of the first papers on the combustion synthesis of fullerenes and nanotubes emerging from a European laboratory. Other work included the effect of the addition of metals and halogenated compounds on fullerene formation in flames. At M.I.T., his work on the separation of higher fullerenes resulted in the identification of compounds up to C₁₁₆. Dr. Richter's activities in kinetic modeling of combustion processes at M.I.T. and Nano-C, have included the development of a reaction network describing the oxidation of different aromatic and aliphatic fuels, formation and consumption of polycyclic aromatic hydrocarbons, soot, and fullerenes. This work has also included the computational determination of thermodynamic and kinetic property data and the assessment of pressure dependence of chemically activated reactions. A chemist by training, he has been working on the synthesis of fullerene and nanotube derivatives at Nano-C. He has been in charge of the NSF SBIR funded work at Nano-C and is leading the efforts in nanotube synthesis. He is co-inventor of several patents and patent applications for the production, separation, and purification of fullerene materials as well as their use in organic photovoltaics.

39. First Name: Kermit
Last Name: Stearns
Nick Name:
Title: Technical Director
Organization: AF Research Lab, Manufacturing Division
Department: USAF
Address 1: Bldg 653, Rm 215
Address 2: 2977 Hobson Way
City: Wright Patterson AFB
State: ohio
Zip: 45433
Phone: 937-904-4340
Email: kermit.stearns@wpafb.af.mil
Website:
Publish Info: Yes
Profession: Government

Groups of Interest:
Quality and reliability

Research Interests:
Investigation of assembly processes for the fabrication of nano devices

Briefly describe your research work:
Investigating nano-material opportunities for AF applications and associated nanomanufacturing technical obstacles.

Bio:
As Technical Director for AF Research Lab's Manufacturing Technology Division, and as Manufacturing Portfolio Manager, Materials and Manufacturing Directorate, Mr. Stearns is responsible for technical and business strategy; technical program advocacy and planning; technical requirements process development; and supporting the Director and Division Chief on all other technical and business matters pertaining to the \$200M annual portfolio. These responsibilities span five separate, yet complementary OSD and AF corporate programs managed by the Division relating to development of DoD-Industry manufacturing and supplier base capabilities.

Mr. Stearns entered federal service in 2005, after completion of a 20-year AF military career and four years in industry. He has over 20 years of specialized experience in program management of weapon systems and technology programs, including as Program Manager of the AC-130U Gunship program and F-22A Communications suite. He has also conducted operations research-based analyses and assessments pertaining to technology applications, life cycle cost, supportability, and logistics readiness at corporate (Pentagon), Product Center, and laboratory levels. This experience also includes supporting and leading corporate level planning

and programming functions as well as creating and defining business processes.

Mr. Stearns received a M.S., Operations Research, from the AF Institute of Technology in 1989, a B.S. in Operations Research, from the AF Academy in 1981, and is AF acquisition certified in Program Management (level III), Logistics (III), and Systems Planning, Research, Development, and Engineering (III).

40. First Name: Pratap
Last Name: Sundar
Nick Name: Pratap
Title: Director
Organization: SRS Innovation Technologies Pvt Ltd
Department: Operations
Address 1: 3-1-54 Fourth Cross East
Address 2: Vidya Nagar
City: TIRUPATI
State: AP
Zip: 517502
Phone: 508-577-0320
Email: pratapsundar@gmail.com
Website:
Publish Info: Yes
Profession: Industry

Groups of Interest:
Planning and control

Research Interests:
Planning and control in nanomanufacturing
Nanomanufactured devices for specific applications, energy, medicine, defense
Other nanotechnology related research

Briefly describe your research work:
Over 25 Years of Experience in Six-sigma, Lean Production and Lean Enterprise, Theory of Constraints, Industrial Engineering, Supply Chain Management, Scenario Planning, Demand Planning, Outsourcing, Collaborative Product Commerce, Mass Customization, Reverse Engineering, Productivity, Dashboard Design, Production and Operations Planning and Control. Authored 18 conference papers; 4 journal papers; and 6 book chapters. Seriously interested in the way NATURE manufactures things. Intrigued by the way NATURE chooses materials (mostly low-cost abundant materials), morphs them into different types that suit the application, miniaturizes, and manufactures. Would like to gain additional knowledge to explore further on the issues of planning and control that NATURE uses to create things,

substances, and organisms. Would like to gain deeper insights into the aspects of NATURE's methods using the tools of nanotechnology.

Bio:

Pratap Sriram Sundar holds BS in Mechanical Engineering, MS in Industrial Engineering, and a PhD in Industrial Engineering (from Northeastern University). Has twelve years of teaching experience, and ten years of consulting experience. Worked as the customer advocacy manager in Paraform Inc., at Santa Clara, CA; and as the director of manufacturing at Innovation Sports Inc., Foothill Ranch, CA. Authored 18 conference papers; 4 journal papers; and 6 book chapters. Presently working as the director of operations in SRS Innovision Technologies Pvt Ltd in India.

40. First Name: Kripa
Last Name: Varanasi
Nick Name: Kripa
Title: d'Arbeloff Assistant Professor
Organization: MIT
Department: Mechanical Engineering
Address 1: 35-209, 77 Massachusetts Avenue
Address 2:
City: Cambridge
State: MA
Zip: 02139
Phone: 617 3245608
Email: varanasi@mit.edu
Website: <http://meche.mit.edu/people/index.html?id=372>
Publish Info: Yes
Profession: Academia

Groups of Interest:

Process yield and repeatability
Quality and reliability
Sensing and prognostics
Planning and control
Cost and scale-up issues

Research Interests:

Physics- and chemistry-based fundamental nano research
Investigation of nano processes for production of nano elements
Investigation of assembly processes for the fabrication of nano devices
Investigation nano materials and their properties
Modeling and simulation of nano elements, nano materials, and nano processes
Quality and reliability of nano-and micro-scale devices and system
Integration of materials and geometries
Nano composites, coatings, nanotubes, nanoparticles
2D Patterning, mask/master fabrication, layer-by-layer assembly
Nanomanufactured devices for specific applications, energy, medicine, defense

Briefly describe your research work:

Our research is in the area of fundamentally altering/controlling thermal-fluid-surface interactions using nanoengineered surfaces, interfaces, and coatings for efficiency enhancements in energy, water and other systems. Hence quality, reliability and sensing issues are crucial in sustainable performance.

Bio:

Dr. Kripa Varanasi is a d'Arbelloff Assistant Professor of Mechanical Engineering at MIT. He received his B.Tech from IIT, Madras and his MS (ME and EECS) and Ph.D from MIT. Prior to joining MIT, Dr. Varanasi was a lead research scientist in the Energy & Propulsion and Nanotechnology programs at the GE Global Research Center, Niskayuna, NY, and was the PI for the DARPA Thermal Ground Plane (TGP) program. The primary focus of his research is in the development of nanoengineered surfaces that can dramatically enhance performance in energy, water, agriculture, aviation, and electronics cooling systems. Dr. Varanasi has filed around 25 patents in this area. He was awarded the First Prize at the 2008 ASME Nanotechnology Symposium and won several awards at GE including Technology Project of the Year (2005) and Best Patent Award (2006, 2009). At MIT he has received the MITEI seed grant, School of Engineering Reed Award, and the 2009 Deshpande Award.

41. First Name: Roshan
Last Name: Vengazhiyil
Nick Name: Roshan
Title: Associate Professor
Organization: Georgia Institute of Technology
Department: Industrial and Systems Engineering
Address 1: 755 Ferst Dr NW
Address 2:
City: Atlanta
State: GA
Zip: 30332
Phone: 4048940056
Email: roshan@gatech.edu
Website: <http://www.isye.gatech.edu/~roshan>
Publish Info: Yes
Profession: Academia

Groups of Interest:

Process yield and repeatability
Quality and reliability

Research Interests:

Investigation of nano processes for production of nano elements

Briefly describe your research work:

My main research work is in using statistical methods for modeling, control, and optimization of nanomanufacturing process.

Bio:

Roshan Joseph Vengazhiyil is an Associate Professor in ISyE. He received a Ph.D. degree in Statistics from the University of Michigan, Ann Arbor in 2002 and holds an M.Tech. degree in Quality, Reliability, and Operations Research and a B.Tech. degree in Production Engineering and Management. He has several years of consulting experience in solving quality-related problems in industries. His research interests are in the broad areas of quality engineering and statistics. A major focus of his research is in developing novel statistical methods for solving complex engineering problems. Dr. Vengazhiyil's honors include Distinguished Dissertation Award from the University of Michigan in 2003, CAREER Award from National Science Foundation in 2005, Jack Youden Prize from the American Society for Quality in 2005, and Coca-Cola Junior Chair Professorship from ISYE in 2008.

42. First Name: Richard
Last Name: Wysk
Nick Name: Rick
Title: Professor
Organization: Penn State University
Department: Industrial and Manufacturing Engineering
Address 1: 310 Leonhard Building
Address 2:
City: University Park
State: PA
Zip: 16802
Phone: 814-863-1001
Email: rwysk@psu.edu
Website: www.engr.psu.edu/cim/wysk.htm
Publish Info: Yes
Profession: Academia

Groups of Interest:
Planning and control

Research Interests:
Planning and control in nanomanufacturing
Integration of functionalities
Integration of materials and geometries
Nanomanufactured devices for specific applications, energy, medicine, defense

Briefly describe your research work:

I am currently designing surface treatments that provide pathogenic protection against a large number of bacteria and fungi. The surfaces

that we are developing have pathways ranging in size from 1 micron to 1 mm. Two important parameters that we are investigating are 1) different geometric feature sizes and 2) different insulator properties (hydrophobic and hydrophilic).

Bio:

Richard A. Wysk is the William E. Leonhard Chair in Engineering and Professor of Industrial Engineering at The Pennsylvania State University. He received his B.S.(1972) and M.S.(1973) in Industrial Engineering and Operations Research from the University of Massachusetts and Ph.D.(1977) in Industrial Engineering from Purdue University. He has also served on the faculties of Virginia Polytechnic Institute and State University and Texas A&M University where he held the Royce Wisenbaker Chair in Innovation.

Dr. Wysk's research and teaching interests are in the general area of Computer Integrated Manufacturing (CIM). In particular, he is interested in Lean Manufacturing, Computer-Aided Process Planning, Flexible Manufacturing Systems (FMSs) and most recently the design and production of bio active medical devices and surfaces. Dr. Wysk has coauthored six books including Computer-Aided Manufacturing, with T.C. Chang and H.P. Wang -- the 1991 IIE Book of the Year and the 1991 SME Eugene Merchant Book of the Year. He has also published more than 150 technical papers in the open-literature in journals including the Transactions of ASME, the Transactions of IEEE and the IIE Transactions. Dr. Wysk is an IIE Fellow, a Fellow of SME, a member of Sigma Xi, and a member of Alpha Pi Mu and Tau Beta Pi. He is the recipient of the IIE Region III Award for Excellence (1982), the SME Outstanding Young Manufacturing Engineer Award (1981), the David F. Baker IIE Distinguished Research Award (1993) and The IIE Albert Holzman Distinguished Educator Award (2009). He also received the Army Bronze Star, and two Army Commendation Medals for his service in Vietnam. Dr. Wysk serves as the Chair of SME Journals Committee and is associate editor for six engineering journals. He has held engineering positions with General Electric and Caterpillar Tractor Company.

43. First Name: Tao
Last Name: Yuan
Nick Name: Tao
Title: Assistant Professor
Organization: Ohio University
Department: Industrial and Systems Engineering
Address 1: 279 Stocker Center
Address 2: Ohio University
City: Athens
State: OH
Zip: 45701
Phone: 740 5931547
Email: yuan@ohio.edu
Website:

Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:
Quality and reliability of nano-and micro-scale devices and system

Briefly describe your research work:
Dr. Tao Yuan's research interests are mainly in reliability of micro-/nano-electronics. His recent research activities include investigation of the failure mechanisms of nano devices, modeling and analysis of defects generated in integrated circuits manufacturing using spatio-temporal stochastic processes, Bayesian analysis of reliability and optimal burn-in, and design of reliability tests. His research goal is to develop effective and efficient methodologies for modeling, analyzing, and enhancing the yield and reliability of nano devices and systems.

Bio:
Dr. Tao Yuan is an Assistant Professor in Industrial and Systems Engineering at Ohio University. Before joining in Ohio University in 2008, he obtained his Ph.D. degree in Industrial Engineering at The University of Tennessee, Knoxville, in 2007, and his Master degrees in Aerospace Engineering and Industrial Engineering at Texas A&M University, College Station, in 2003 and 2004, respectively. He is a member of IIE, IEEE, and INFORMS.

44. First Name: Shiyu
Last Name: Zhou
Nick Name:
Title: Associate Professor
Organization: University of Wisconsin - Madison
Department: Industrial and Systems Engineering
Address 1: 1513 University Ave.
Address 2:
City: Madison
State: Wisconsin
Zip: 53706
Phone: 608-262-9534
Email: szhou@engr.wisc.edu
Website: <http://www.engr.wisc.edu/mpac/>
Publish Info: Yes
Profession: Academia

Groups of Interest:
Quality and reliability

Research Interests:

Quality and reliability of nano-and micro-scale devices and system
Diagnostics and prognostics of nano- and micro-scale processes and systems
Sensing of nano- and micro-scale process and systems
Nano composites, coatings, nanotubes, nanoparticles
2D Patterning, mask/master fabrication, layer-by-layer assembly

Briefly describe your research work:

My research focuses on fault management of engineering systems such as large-scale manufacturing processes. The term "fault management" used here refers to fault detection and monitoring, diagnosis, prediction, and elimination. Due to the rapid development of information and sensing technology, an abundance of data including both process/product design and in-process measurement data are now readily available. The data rich manufacturing environment provides great opportunities to develop new fundamental engineering tools for effective process control. My research integrates advanced statistical modeling methods, physical knowledge of the process, signal processing, and dynamic control theories, and leads to the development of innovative fault management and process control methodologies. The research has been applied to various manufacturing processes such as machining, assembly, hot rolling processes. Recently, my research focused on process control and variation reduction issues of the ultrasonic cavitation based nanocomposite fabrication process and targets bringing this process from lab environment to a scale-up industrial environment. The ultrasonic cavitation based dispersion of nanoparticles in aluminum and magnesium alloy melts has been shown to be a very promising process of producing metal matrix nano-composites. The objective of the research is to discover the fundamental processing/microstructure/property relationship in this fabrication process through the integration of statistical methods and physical analysis, and then utilize the relationship for process optimization and control. Some interesting results such as quantitative evaluation of the nanoparticle dispersion have been obtained.

Bio:

Shiyu Zhou is an associate professor in the Department of Industrial and Systems Engineering at the University of Wisconsin-Madison. He got his B.S. and M.S. in Mechanical Engineering at University of Science and Technology of China in 1993 and 1996 respectively, and got his Master in Industrial Engineering and Ph.D. in Mechanical Engineering at the University of Michigan in 2000. Dr. Zhou's research interests are the in-process quality and productivity improvement methodologies by integrating statistics, system and control theory, and engineering knowledge. His research is sponsored by National Science Foundation, Department of Energy, NIST-ATP, and industries. He is a recipient of the CAREER Award from the National Science Foundation and the Best Application Paper award from IIE Transactions in 2006. Dr. Zhou is a member of IIE, INFORMS, ASME, SME, and ASQ.