Kozo Saito

Director and Professor University of Kentucky

Educational Institution; 5001-10,000 employees; Higher Education industry

Greg Baiden

Professor - Robotics and Mine Automation at Laurentian University
– Ontario – Canada

Owner at Penguin Automated Systems Inc.

Past

Manager - Mines Research at Inco Limited
Manager - Mines Research at Inco Limited
Education
McGill University
Queen's University
Queen's University

Orenthral Morgan

Mechanical Design - Senior at Pratt & Whitney (A division of United Technologies Corporation) Hartford, Connecticut Area
Design Engineer - Engineer at Pratt & Whitney

Education
University of Alabama at Birmingham
Auburn University

Orenthral Morgan's Summary

Front Hub Shaft Design Bombardier / MRJ / 30K A320
Implemented curvic design to various parts
Definition of special fillets for stress reduction
Developed rough machining prints to keep project on schedule
Assisted tool designers to properly load part while testing
Aft hub designer 30K A320
Develop repairs based on legacy experience
UG Unigraphics 2d and 3d Modeling
Integral Blade Rotor Design

Familiarity with ANSYS and FIPER optimization tools

Near Term Goals: Master hand-calcs required to design better "off the cuff " to reduce time during optimization phase
Long Term Goals: Participate in manned mission to Mars and terraforming Mars. Possibly as a design integrator coordinating with multiple teams, structures, design, systems etc.

Specialties: Engineering Analysis -Bolt Stress, True Position, Material Selection, Negotiating with Vendors on Technical Issues, Curvic stacking methodology.

Orenthral Morgan's Experience

Mechanical Design - Senior Design Engineer Engineer

Pratt & Whitney
Public Company; 10,001+ employees; UTX; Aviation & Aerospace industry 2000 – Present (12 years)

Orenthral Morgan's Skills & Expertise

Engineering Analysis Material Selection Unigraphics ANSYS Aerospace

Orenthral Morgan's Education

University of Alabama at Birmingham
Master's degree, Mechanical Engineering 2000 – 2002
Published in AIAA Journal of Propulsion and Power "Effects of Paramagnetism on Combustion"
Activities and Societies: ASME
Auburn University
Bachelor of Science (BS), Mechanical Engineering 1996 – 2000

Arunava Gupta

MINT Professor
MATERIALS and PHYSICAL CHEMISTRY
M.Sc.,1976, Indian Institute of Technology; M.A., 1977, Columbia University; Ph.D., 1980, Stanford University.
affiliations: Center for Materials for Information Technology

Research Interests

Investigation of nanostructured materials, with emphasis on the controlled fabrication and synthesis of novel structures, manipulating and probing their surface and interface properties, and exploring potential applications. Implementation of a multidisciplinary approach, interfacing chemistry, materials science, physics and biology.

Materials for information technology, in particular spintronics (spin-based electronics). Traditional semi-conductor devices rely on the transport and storage of electronic charge. Spintronics exploits electron spin, creating a new class of devices that can potentially be scaled down to nano-dimensions and can also provide additional functionality. Research goals include: 1) thin film growth utilizing a variety of deposition techniques, including chemical vapor deposition, pulsed laser deposition and sputtering; 2) utilization of a combinatorial approach for depositing and characterizing these films where possible to enable rapid screening of a wide variety of materials; 3) synthesis and characteriza-tion of novel magnetic thin films and heterostructures, in particular oxides, with atomic layer control of the interfaces; 4) fabrication of devices, such as magnetic tunnel junctions and spin-based semiconductors, using these materials for storage, memory and logic functions.

Nanostructured materials for biomedical applications, with emphasis on magnetic oxides. Magnetic nanoparticles represent an extremely interesting group of inorganic materials having a close connection to living systems. They offer exciting possibilities for use in the detection, manipulation and functional control of biomolecules and cells, with potential medical applications in areas such as targeted drug delivery, magnetic fluid hyperthermia and contrast imaging. Research goals emphasize the development of: 1) novel synthetic strategies for the production of various shape nanostructures, including particles, wires, tubes or ribbons; 2) subsequent modification of their surface with coatings to render them biocompatible and enable selective surface immobilization of bioactive molecules.

Representative Publications

"Self-assembly and magnetic properties of shape-controlled monodisperse $CoFe_2O_4$ nanocrystals." Bao, N.; Shen, L.; Padhan, P.; Gupta, A. *Appl. Phys. Lett.* 92, 173101/1-173101/3 (2008).

"Shape-controlled monocrystalline ferroelectric barium titanate nanostructures: from nanotubes and nanowires to ordered nanostructures." Bao, N.; Shen, L.; Srinivasan, G.; Yanagisawa, K.; Gupta, A. *J. Phys. Chem. C* 112, 8634-8642 (2008).

"Self-assembly of nanostructured [MoS42-]-copolymer hybrids by solvent evaporation induction." Bao, N.; Shen, L.; Yanagisawa, K.; Domen, K.; Grimes, C. A.; Gupta, A. *Mater. Lett.* 62, 648-650 (2008).

"Raman spectroscopy of La_2NiMnO_6 films on $SrTiO_3$ (100) and $LaAlO_3$ (100) substrates: Observation of epitaxial strain." Burgess, J.; Guo, H.; Gupta, A.; Street, S. *Vib. Spectrosc.* 48, 113-117 (2008).

"Hydrothermal Splitting of Titanate Fibers to Single-Crystalline TiO_2 Nanostructures with Controllable Crystalline Phase, Morphology, Microstructure, and Photocatalytic Activity." Shen, L.; Bao, N.; Zheng, Y.; Gupta, A.; An, T.; Yanagisawa, K. *J. Phys. Chem. C* 112, 8809-8818 (2008).

"Plasma enhanced chemical vapor deposition of Cr_2O_3 thin films using chromium hexacarbonyl ($Cr(CO)_6$) precursor." Wang, J.; Gupta, A.; Klein, T. M. *Thin Solid Films* 516, 7366-7372 (2008).

"A Facile Thermolysis Route to Monodisperse Ferrite Nanocrystals." Bao, N.; Shen, L.; Wang, Y.; Padhan, P.; Gupta, A. *J Am Chem Soc* 129, 12374-12375 (2007).

"Organic Molecule-Assisted Hydrothermal Self-Assembly of Size-Controlled Tubular ZnO Nanostructures." Shen, L.; Bao, N.; Yanagisawa, K.; Domen, K.; Grimes, C. A.; Gupta, A. *J. Phys. Chem. C* 111, 7280-7287 (2007).

"Direct growth of comet-like superstructures of Au-ZnO submicron rod arrays by solvothermal soft chemistry process." Shen, L.; Bao, N.; Yanagisawa, K.; Zheng, Y.; Domen, K.; Gupta, A.; Grimes, C. A. *J. Solid State Chem.* 180, 213-220 (2007).

"Size-Controlled Synthesis of Magnetic $CuCr_2Se_4$ Nanocrystals." Wang, Y.-H. A.; Bao, N.; Shen, L.; Padhan, P.; Gupta, A. *J Am Chem Soc* 129, 12408-12409 (2007).

Settimio Grimaldi

Senior scientist presso CNR-IFT Roma, Italia

Settore Centri di ricerca
Current

senior scientist at national research council of italy institute of translational pharmacology
senior scientist at CNR-IFT

Education

Università La Sapienza
Connections
Settimio Grimaldi's Experience
Senior scientist national research council of italy institute of translational pharmacology
Attualmente ricopre questo ruolo.
senior scientist
CNR-IFT giugno 1969 – Presente (42 anni 11 mesi)
Biochimico- Effetti Biologici Campi elettromangetici, Drug Targeting
Settimio Grimaldi's Education
Università La Sapienza
Ph.D Chemistry NIH Visiting Fellow NIH Visiting Associate NIH Visiting Scientist

John Baker

Capstone Engineer

- Fall 2006
- Fall 2008
- Fall 2009
- Spring 2007
- Spring 2008
- Spring 2009

Dr. John Baker

- Professor

Departments

- Mechanical Engineering

Education

- Ph.D., Mechanical Engineering, University of Kentucky
- M.S., Mechanical Engineering, University of Kentucky
- B.S., Mechanical Engineering, University of Kentucky

Dr. John Baker's research interests include combustion, propulsion, thermodynamics, reactive flows, transport phenomena, and thermal radiation heat transfer. His current research activities include: an experimental study of the interaction between magnetic fields and diffusion flames (using holographic interferometry), an experimental study of laminar slot diffusion flames in reduced gravity, a theoretical and experimental study of turbulent induced vortex flames, an experimental study into the effect that temperature and pressure have on fuel injection behavior (using particle image velocimetry, PIV), an experimental evaluation of an electrostatic injection system for diesel engine applications, a theoretical investigation into the thermodynamic optimization of fuel cells, a theoretical investigation into the use of magnetic fields to enhance rocket performance, and a fundamental investigation into combustion at "microscales."

Baker is also involved in a project for the NSF Research Experience for Undergraduates Fluid Mechanics with Analysis Using Computations and Experiments Program.

Wasserbauer Joseph F.

Pubblicazioni

Performance and surge limits of a TF30-P-3 turbofan engine/axisymmetric mixed-compression inlet propulsion system at Mach 2.5 by Joseph F Wasserbauer

Boundary-layer bleed system study for a full-scale, mixed-compression inlet with 45 percent internal contraction by Robert J Shaw - The results of an experimental bleed development study for a full-scale, Mach 2.5, axisymmetric, mixed-compression inlet were presented. The inlet was designed to satisfy the airflow requirements of the TF30-P-3 turbofan engine. Capabilities for porous bleed on the cowl surface and ram-scoop flush-slot bleed on the centerbody were provided. A configuration with no bleed on the cowl achieved a minimum stable, diffuser exit, total pressure recovery of 0.894 with a centerbody-bleed mass flow ratio of 0.02. Configurations with cowl bleed had minimum stable recoveries as high as 0.900 but suffered range decrement penalties from the increased bleed mass flow removal. Limited inlet stability and unstart angle-of-attack data are presented.

Performance of vortex generators in a Mach 2.5 low-bleed full-scale 45-percent-internal-contraction axisymmetric inlet by Harvey E Neumann

Design of a very-low-bleed Mach 2.5 mixed-compression inlet with 45 percent internal contraction by Joseph F Wasserbauer

Distortion in a full-scale bicone inlet with internal focused compression and 45 percent internal contraction by Joseph F Wasserbauer

Field-enhanced thermionic emission from electrodes of cesium ion thrustor by Joseph F Wasserbauer

Dynamic response of a Mach 2.5 axisymmetric inlet with engine or cold pipe and utilizing 60 percent supersonic internal area contraction by Joseph F Wasserbauer - Dynamic response of supersonic mixed compression inlet coupled to cold pipe or turbojet engine

A 5-centimeter-diameter electron-bombardment thrustor with permanent magnets by Joseph F Wasserbauer

Performance of small (100-lb thrust) rocket motors using coaxial injection of hydrazine and nitrogen tetroxide by Joseph F Wasserbauer

Field-Enhanced Thermionic Emission from Electrodes of Cesium Ion Thrustor

Effect of fuselage circumferential inlet location on diffuser-discharge total-pressure profiles at supersonic speeds by Emil J Kremzier - An experimental investigation of the effect of angle of attack and inlet corrected air flow on diffuser-discharge total-pressure profiles of inlets located in various circumferential positions on a fuselage was conducted at supersonic speeds. Results indicated that the diffuser total-pressure profiles for a bottom inlet were least affected by angle of attack on distortion level was obtained with a side inlet. Variation in distortion for top inlets with angle of attack was confined to the supercritical range of inlet operation.

Interaction of a jet and flat plate located in an airstream by Gerald W Englert - The interaction between a flat plate and a nearby jet issuing from a convergent nozzle was studied over a range of pressure ratios from jet-off to 9 and at free-stream Mach numbers of 0.1, 0.6 1.6, and 2.0. The effect on this interaction of the presence of streamline, blunt-base, and curved-base fairings was also investigated. The plate was located at various distances from and at various angles with respect to the nozzle axis of symmetry.

Interaction of an exhaust jet and elementary contoured surfaces located in a supersonic air stream by Joseph F Wasserbauer - The interaction of an exhaust jet and elementary contoured surfaces was studied systematically at a free-stream Mach number of 1.6 over a range of nozzle pressure ratios from a jet-off condition to a pressure ratio of 9. The effect of the presence of streamline fairings between the surfaces and parabolic afterbody housing the exhaust nozzle on this interaction was also investigated. These surfaces were located at two fixed distances from the nozzle centerline.

Boundary-layer bleed system study for a full-scale, mixed-compression inlet with 45 percent internal contraction

Design of a very-low-bleed Mach 2.5 mixed-compression inlet with 45 percent internal contraction

Distortion in a full-scale bicone inlet with internal focused compression and 45 percent internal contraction

Performance of vortex generators in a Mach 2.5 low-bleed full-scale 45-percent-internal-contraction axisymmetric inlet

Experimental and analytical investigation of the dynamic response of a supersonic mixed-compression inlet by Joseph F Wasserbauer

Performance of a bicone inlet designed for Mach 2.5 with internal distributed compression and 40-percent internal contraction by Joseph F Wasserbauer

Experimental investigation of the performance of a Mach-2.7 two-dimensional bifurcated duct inlet with 30 percent internal contraction by Joseph F Wasserbauer - An experimental study was conducted to determine the performance of a two-dimensional, mixed-compression bifurcated duct inlet system designed for a free-stream Mach number of 2.7. Thirty percent of the supersonic area contraction occurred internally. A movable ramp was used to vary the contraction ratio for off-design operation. Boundary layer bleed regions were located on the cowl, centerbody, and sidewall surfaces. There were also provisions for vortex generators on

the cowl and centerbody of the subsonic diffuser. Data were obtained over the Mach number range of 2.0 to 2.8 and at angles of yaw from 0 deg. to the maximum value prior to inlet un-start. The test at Mach 2.8 was to obtain data for an over- speed condition. The Reynolds number varied from 2.5 to 2.3 million/ft for Mach numbers above 2.5. At Mach numbers of 2.5 and lower, the Reynolds number was set at 2.5 million/ft. Bleed patterns, vortex generator patterns, and ramp position were varied, and three inlet configurations were selected for more extensive study. Two of these configurations had self-starting capability. The self-starting configuration that was developed produced 89 percent total pressure recovery at the compressor face station with 6.8 percent total bleed. The compressor face distortion was about 16 percent. Vortex generators were extremely effective in re-distributing flow but were not as effective in reducing distortion. Excellent flow symmetry was achieved between the separated halves of the inlet, and twin-duct instability was not observed. The ramp tip shock was steeper than expected. This caused the cowl lip shock to be reflected from the ramp instead of being cancelled at the shoulder. However, peak recovery at the throat was still obtained with the ramp near the design position.

Dr. Roger M. Myers

Aerojet General Corporation

ROGER M. MYERS is the deputy lead for space and launch systems business unit and executive director, electric propulsion and integrated systems for Aerojet General Corporation, providing strategy, program management, and business management oversight for Aerojet's space systems. Prior to this appointment, Dr. Myers was the general manager of Aerojet, Redmond Operations, a 430 person organization that generates over $100 M in sales annually in its Space Propulsion and Safety Products businesses. His responsibilities include strategic planning, program oversight, financial performance, and other Redmond site functions. Dr. Myers is also the executive director of electric propulsion and integrated systems department at the Redmond facility, leading programs and strategic planning for advanced spacecraft systems development. Prior to this appointment he served as the executive director, systems and technology development, focused on the development, qualification, and first-article flight production of leading-edge chemical and electric propulsion systems for Aerojet. Prior to joining Aerojet Redmond Operations (then Olin Aerospace) in 1996 as the director, electric propulsion, Dr. Myers held various supervisory and research positions at the NASA Glenn Research Center (then the NASA Lewis Research Center) and Princeton University. Dr. Myers earned his Ph.D. in mechanical and aerospace engineering at Princeton University and a B.S. aerospace engineering, summa cum laude, from the University of Michigan. His previous NRC membership service includes the Panel to Review Air Force Office of Scientific Research (AFOSR) Proposals in Propulsion – 2005 and Panel J: High-Energy Power and Propulsion and In-space Transportation.