

Summary of Faculty Research Interests

John Verboncoeur, Associate Dean for Research

College of Engineering

23 January 2018

Biomedical Engineering

Sudin Bhattacharya, Assistant Professor, Biomedical Engineering and Pharmacology & Toxicology

I am broadly interested in several areas of computational toxicology. A major focus of my work is the application of computational methods to study the signaling and transcriptional regulatory networks that underlie the determination of cell fate, and the perturbation of these networks by environmental pollutants like dioxin. Specifically, I am interested in integrating diverse genomic data sets to map and model transcriptional regulatory networks and their environmental perturbation in the immune system and the liver. I am also interested in the extraction of predictive features from genomic data sets to model the toxic potential of chemical agents and pharmaceuticals, and spatial multi-scale modeling of tissue-level phenomena like toxicant-induced liver injury. I rely primarily on mathematical and statistical modeling as a research tool, and work in close collaboration with experimental scientists.

Christopher H. Contag, Hannah Distinguished Professor of Biomedical Engineering and Microbiology & Molecular Genetics; Chair, Biomedical Engineering; Director, Institute for Quantitative Health Science & Engineering

A pioneer in molecular imaging, he is developing imaging approaches aimed at revealing molecular processes in living subjects, including humans, and the earliest markers of cancer.

Assaf Gilad, Professor, Biomedical Engineering

The overarching theme of his research program harnesses the intersection of radiology and molecular biology to develop new in vivo imaging technologies that can be used to tackle fundamental biological questions.

Masako Harada, Assistant Professor, Biomedical Engineering

My current research interest is to understand the biology and the function of extracellular vesicles (EVs) both in physiological and pathophysiological condition, aiming to develop a novel tool for diagnostics and treatment.

Xuefei Huang, Professor, Biomedical Engineering

The chemistry of carbohydrates and their biology is the major emphasis of our research. Carbohydrates play important roles in many biological processes such as inflammation, tumor metastasis, bacterial and viral infections. Detailed understanding of many of these processes is still lacking. Building on our strength in synthetic chemistry, we take a multi-disciplinary approach to study this important class of molecules. Our research encompasses several areas including synthetic organic chemistry, nanoscience and chemical immunology.

Galit Pelled, Professor, Biomedical Engineering

Prof. Pelled's research interests span a wide range of experimental and theoretical approaches that include neuroimaging, neuronal computation and modeling, neuro-nanotechnology, neurophotonics, brain stimulation and neuromodulation, neuro-prostheses, brain-computer and brain-machine interfaces.

Erin Purcell, Assistant Professor, Biomedical Engineering

Dr. Purcell is pursuing new approaches to characterize, modulate, and regenerate neuronal responses at the interface of electrodes implanted in the brain.

Zhen Qiu, Assistant Professor, Biomedical Engineering

Zhen Qiu's research interests include biomedical optics, MEMS/MOEMS, multi-modal targeted imaging, wearable and implantable medical devices, ultrafast laser applications. He aims to study both cancer biology and translational medicine with custom-made micro-systems enabled ultra-thin in-vivo sensing/imaging tools. His current work is mainly focused on miniaturized optical imaging system development for early cancer detection and imaging guided surgical navigation, such as wide-field imaging guided micro-scanner based confocal microendoscope, multi-photon/SHG handheld microscope, and surface-enhanced Raman spectroscopy.

Dana Spence, Professor, Biomedical Engineering

Prof. Spence is currently solving biological problems at the molecular level with the help of novel biotechnology method development is the primary goal in the Spence group.

Robert Worden, Professor, Biomedical Engineering

Professor Worden's research interests include anotechnology, nanostructured biomimetic interfaces; biochemical engineering; protein expression; fermentation engineering; multiphase biocatalysis; biobased products.

Kurt Zinn, Professor, Biomedical Engineering

Prof. Zinn's research includes the development of molecular imaging approaches for cancer diagnosis, treatment monitoring, and therapy. Dr. Zinn has contributed significantly to more than ten phase I clinical trials.

Biosystems and Agricultural Engineering

Umesh Adhikari, Research Associate, Biosystems and Agricultural Engineering

Umesh's research interests include the use of constructed wetlands for water quality improvement, hydrological modeling and simulation, assessment of watershed-scale wetland restoration scenarios, climate change impacts on water resources, agricultural production and food security, quantitative microbial risk assessment and characterization.

Evangelyn C. Alocilja, Professor, Biosystems and Agricultural Engineering

Prof. Alocilja's research interests are in development of nanoparticle-based biosensors for rapid, point-of-care/on-site detection and diagnosis of disease-causing agents and adulterants of concern to homeland security, global health, food/water safety, and product integrity. She received the 2012 Innovator Award from MSU. She is also the founder and Chief Scientific Officer of nanoRETE, Inc., a start-up company in Lansing, MI that commercializes biosensor technologies.

Kirk Dolan, Associate Professor, Biosystems & Agricultural Engineering, Food Science & Human Nutrition

Kirk Dolan has joint appointments in Department of Food Science & Human Nutrition (lead), and Department of Biosystems & Agricultural Engineering. His research is on modeling thermal processing of foods (canning, drying, aseptic, etc.), and on inverse problems and parameter estimation. His research group is a leading user of MATLAB with COMSOL for parameter estimation, and has demonstrated new statistical analysis methods for food researchers. He is the

chairman and organizer of the triennial Inverse Problems Symposia at Michigan State University. His extension work includes organizing and co-teaching the FDA-mandated Better Process Control School for certification, co-teaching an annual HACCP course to industry, and assisting Michigan food entrepreneurs with FDA product registration.

Darrell W. Donahue, Professor and Chair, Biosystems and Agricultural Engineering

Over the past 20 years, Donahue has served as a consultant for several Fortune 500 companies for his expertise in economic modeling, team development and operational skills. Donahue's research focus is on process engineering systems for food and agriculture. Over the past dozen years, he has added the study of risk assessment modeling to that work.

Ehsan Ghane, Assistant Professor, Biosystems and Agricultural Engineering

Ehsan's research and extension interests in the areas of water quality and agricultural drainage. I provide education to diverse groups representing drainage contractors, agricultural producers, water, and the public. My main research goal is to address agricultural water management issues related to non-point source pollution (i.e., excess nitrogen and phosphorous). I am interested in innovative practices that can reduce nutrient load runoff to surface water and conserve water for crop use.

Aluel Go, Visiting Outreach Specialist, Biosystems & Agricultural Engineering

- 1) Applied energy efficiency for agricultural producers and rural businesses.
- 2) Energy Audits and Renewable Assessment standards/procedures for agricultural operations and rural businesses.
- 3) Neutral to Earth Voltage detection, evaluation and remedial options.
- 4) Alternative options for large motor systems under single phase environments.
- 5) LED lighting for use in increasing agricultural production.
- 6) Applied solar-thermal systems for dairy water heating.

Daniel Guyer, Professor, Biosystems and Agricultural Engineering

Dr. Guyer's areas of expertise: basic and applied research in postharvest handling, grading, value-added processing and storage of fruits, vegetables and chestnuts; developing technology and sensors for nondestructive assessment of quality of horticultural crops in the domains of machine vision, spectroscopy, computed tomography, image processing, pattern recognition and specialty crop automation.

Timothy Harrigan, Associate Professor, Biosystems and Agricultural Engineering

Timothy's research interests include mitigation of farming system impacts on sediment and pollutant transport on the landscape; cropping and nutrient management impacts at the field and watershed level; precision agriculture; manure management and land application, tillage and planting.

Sanghyup Jeong, Assistant Professor, Biosystems and Agricultural Engineering

Dr. Jeong's expertise is in the field of Food Safety Engineering. His research interests are developing nonthermal/thermal food safety intervention technologies, microbial modeling, and process optimization techniques to reduce the risk of foodborne disease. Recent research activities are focused on fresh produce/low-moisture food safety, food irradiation, and process optimization/scale-up techniques which are reflected in various research projects.

Dana Kirk, Assistant Professor, Biosystems and Agricultural Engineering

In addition, to his teaching and outreach responsibilities, he is the manager of the Anaerobic Digester Research and Education Center (ADREC). The ADREC is collaborative effort between

the University and a private foundation to provide a continuum of research, professional development and outreach support for waste-to-energy systems. He has overseen design, construction and operation of three commercial scale digesters and numerous demonstration and pilot scale systems.

Wei Liao, Associate Professor, Biosystems and Agricultural Engineering

Dr. Liao's research interest is in the development of integrated biorefining concept to convert agricultural residues to biofuels and bioproducts. His current research projects include: (1) Integration of solar-, bio- and nano- technologies for waste treatment and value-added fuels/chemical production; (2) Algal cultivation for water reclamation and biofuel production; (3) Development of novel anaerobic cultivation systems to convert lignocellulosic materials into advanced fuels.

Yan (Susie) Liu, Associate Professor, Biosystems and Agricultural Engineering.

Dr. Liu's main research foci are to: 1) establish a pelletized fungal platform for value-added biofuel/chemical production; 2) develop algae strains for recombinant proteins production and nutrient (N, P) removal; and 3) utilize the symbiotic characters of mix culture (bacteria and fungi) for value added chemicals and enzymes production.

Renfu Lu, Adjunct Professor, Biosystems and Agricultural Engineering

Dr. Lu is conducting and leading research in sensors and sensing technologies for property characterization and quality evaluation of fruits and vegetables. He is Lead Scientist for the federally appropriated in-house research project "Technologies for Quality Measurement and Grading of Fruits and Vegetables" with the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS)- the principal federal government research agency in agriculture, food and natural resources.

Bradley Marks, Professor, Biosystems and Agricultural Engineering

Prof. Marks's research focuses on food safety engineering, aimed at developing improved methods for the design, operation, and validation of processing systems for commercially produced food products. Current projects include: (1) Developing improved predictive microbial models for foodborne pathogen response to product and process conditions, (2) Improving validation methods for pasteurization of low-moisture foods, and (3) Modeling bacterial transfer and transport during processing of fresh produce. Prof. Marks also currently leads the MSU Food Safety Group, a multidisciplinary group of ~28 food safety researchers at MSU, and manages the MSU Biosafety Level-2 Pilot Processing Facility.

Iice Medina Meza, Assistant Professor, Biosystems & Agricultural Engineering

Effects of oxidative stress on peroxidation of lipids and steroids. The goals of our laboratory are elucidate molecular mechanisms governing oxidative stress, and to translate our findings to develop biomarkers for prevention and treatment of chronic diseases (e.g. cardiovascular and neurodegenerative diseases). Current projects are focused on 1) developing drug modulators of cholesterol oxidation to damp inflammation on cardiovascular disease, and 2) metabolomic mapping of oxysterols and other lipid peroxides for risk assessment in highly susceptible populations, 3) Fingerprinting of plant secondary metabolites and understanding its role in life processes.

Jade Mitchell, Assistant Professor, Biosystems and Agricultural Engineering

Dr. Mitchell's research interests are in analytical and statistical modeling for human health risk analysis. Her recent work includes: (1) Developing novel dose-response relationships for pathogenic agents using Bayesian methods within the quantitative microbial risk assessment (QMRA) paradigm for illnesses caused by bioterrorism, water and food borne diseases; (2) Evaluating exposure models to prioritize exposures to chemicals through environmental media and food; (3) Establishing decision analytic frameworks for risk management decisions for microbial and chemical stressors in the environment with government partners including the USEPA and USDA. She is an active member of the Society for Risk Analysis.

A. Pouyan Nejadhashemi, Associate Professor, Biosystems and Agricultural Engineering

Dr. Nejadhashemi's research interests are in ecohydrology and water resources management. His recent collaborative scholarly work includes: (1) Model the hydrological significant of wetland restoration scenarios; (2) Environmental impact assessment of large-scale bioenergy crop production on human and aquatic ecosystem health; (3) sensitivity and uncertainty analysis of water quality mitigation approaches to address climate change. He is an associate editor for the two journals of Applied Engineering in Agriculture and Transactions of the American Society of Agricultural and Biological Engineers (ASABE).

Fei Pan, Assistant Professor, Biosystems and Agricultural Engineering

Areas of expertise: system analysis of biomass feedstock supply chain logistics, including computer modeling and simulation in supply chain logistics cost analysis; innovative technologies in woody biomass harvesting, pre-processing, storage, and transportation; and net energy analysis in using woody biomass for biofuel and bio-based products.

Luke Reese, Associate Professor, Biosystems and Agricultural Engineering

Biosystems and Agricultural Engineering Technology Systems Management (TSM) Coordinator
BAE Industry Advisor Board Liaison
BE placement and career services support
Courses taught- Information Management and Internship Coordination, Freshman Seminar Sustainable Food, Environment and Social Systems in Australia - Summer MSU Extension Technology Training Coordinator - Adobe Connect training

Dawn Reinhold, Associate Professor, Biosystems and Agricultural Engineering

Dr. Reinhold's research group aims to advance use of plant-based ecological systems to address water quality issues, including pollution of waters by agricultural runoff, storm water runoff, urban and agricultural wastewaters, and hazardous wastes. Research focuses on plant-based ecosystems, such as wetlands, filter strips, best management practices, and phytoremediation, and on how plants affect the fate of pollutants. She has federally funded projects on use of plant tissue culture to enhance phytoremediation traits in wetland plants and fate of antimicrobials in food crop systems.

Steve Safferman, Associate Professor, Biosystems and Agricultural Engineering.

Dr. Safferman conducts research on treatment trains to minimize and treat wastes including those originating from animal agriculture and food processing, the conversion of high energy waste to biogas that serves as a renewable energy source, and novel reactor designs such as anaerobic membrane systems and fluidized bed reactors. He lead the development of modeling and evaluating techniques for anaerobic digestion systems including empirically screening feedstock to estimate energy potential, conducting biogas potential assays, conducting bench-scale treatability testing, evaluating novel farm-scale technologies, and developing decision support guidance. Teaching activities include the coordination and team teaching of three required Department classes and an interdisciplinary sustainability class in the Honors College.

Chris Saffron, Assistant Professor, Biosystems and Agricultural Engineering, Chemical Engineering and Materials Science

Dr. Saffron's research is on biomass conversion by thermochemical approaches to fuels and chemicals. His recent scholarly work includes: (1) Biomass pyrolysis to bio-oil, biochar and combustible gas; (2) Bio-oil stabilization by electrocatalytic hydrogenation and hydrodeoxygenation; (3) Improved biomass selection for Thermoconversion through multivariate analysis; (4) Biomass torrefaction for solid fuel production; and (5) Systems analysis including life cycle assessment and technoeconomic analysis. Dr. Saffron is a member of the American Institute of Chemical Engineers, the American Chemical Society, and the American Society for Agricultural and Biological Engineers.

Ajit Srivastava, Professor, Biosystems and Agricultural Engineering

Prof. Srivastava's research interests include; machinery systems food production and processing, bioenergy systems, dimensional analysis and scale modeling. Prof. Srivastava is a Fellow of the American Society of Agricultural and Biological Engineers (ASABE).

Truman Surbrook, Professor, Biosystems & Agricultural Engineering

Professor Surbrook's research interests include; Applied energy efficiency for agricultural producers and rural businesses, Energy Audits and Renewable Assessment standards/procedures for agricultural operations and rural businesses, Neutral to Earth Voltage detection, evaluation and remedial options Alternative options for large motor systems under single phase environments, LED lighting for use in increasing agricultural production, Applied solar-thermal systems for dairy water heating.

Chemical Engineering and Material Science

Venkatesh Balan, Associate Professor, Chemical Engineering and Materials Science

Current research areas Dr. Balan is working on are: biomass process engineering, biomass conversion, renewable energy, value added products from agricultural residues and modeling integrated agricultural operations.

Scott Calabrese Barton, Professor, Chemical Engineering and Materials Science

His research focus is on non-precious metal catalysts based on redox enzymes and transition metals, which have lower costs compared to precious metals, but are challenging in terms of overall activity and stability and often are implemented at high loadings that lead to transport limitations.

Kris Arvid Berglund, University Distinguished Professor, Food Science & Human Nutrition, Chemical Engineering & Materials Science, Chemistry (adjunct)

Prof. Berglund's research is aimed at creating value-added products from agricultural and forest based raw materials. This goal is pursued by use of bacterial and yeast fermentations combined with separation processes, in particular, distillation, extraction, and crystallization. Specific examples include distilled beverages, food ingredients, and fuel additives. In addition to the activities at MSU, Dr. Berglund is Professor of Biochemical and Chemical Process Engineering at Luleå University of Technology in Luleå, Sweden where he conducts research in value-added processes for the pulp and paper industry.

Thomas Bieler, Professor, Chemical Engineering and Materials Science

Mechanical deformation of metallic materials: cold, warm and hot deformation, creep, superplasticity, high strain rate deformation, electron microscopy, synchrotron x-ray diffraction, orientation imaging microscopy (EBSP mapping); texture and microtexture, damage nucleation; crystal plasticity finite element simulations of deformation in titanium alloys, solders, intermetallics, refractory metals.

Carl Boehlert, Professor, Chemical Engineering and Materials Science

Professor Boehlert's research areas of interest include materials processing, microstructural evolution, mechanical testing and behavior, microscopy, and microstructure-property relationships of high-temperature alloys, lightweight magnesium structural alloys, and metal matrix composites.

V. Bobby Bringi, Research Professor, Chemical Engineering and Materials Science

Dr. Bringi leads the team of developers working to commercialize afex—a disruptive technology that upgrades underutilized agricultural residues into high-quality cattle feed as well as a feedstock for biobased fuels and chemicals. The afex project is a collaborative partnership between msu, mbi, and other international institutions and agencies. Dr. Bringi was the co-founder of Phyton, a venture that developed and commercialized a groundbreaking route to the sustainable production of the anti-cancer drug, Taxol, in collaboration with Bristol Myers Squibb. He later served as ceo of mbi, presiding over its growth into a well-respected biotechnology hub that has been sought after by leading industry and academic innovators for derisking and scale-up services. He earned his doctorate from Cornell University in chemical engineering. In 2015, Bringi was elected as a Fellow of the American Institute for Medical and Biological Engineering.

Christina Chan, George W. Bissell Professor, Chemical Engineering and Materials Science

Prof. Chan's research interests are in computational and systems biology, disease mechanisms, drug delivery and tissue engineering. Her research focuses on understanding the molecular, signaling and cellular processes that are altered in diseases.

Xanthippi Chatzistavrou, Assistant Professor, Chemical Engineering and Materials Science
Xanthippi Chatzistavrou is an expert in glass-ceramic composites, with applications in dentistry and orthopedics. Her research is focused on biomaterials with bioactive and bactericidal properties for tissue healing and regeneration for hard and soft tissue regeneration. She also is interested in antibacterial bioactive glasses and glass-ceramics with bactericidal action against antibiotic resistance strains.

Shiwang Cheng, Assistant Professor, Chemical Engineering and Materials Science
My group focuses on the fundamental understanding of the mechanics and dynamics of polymers and polymer nanocomposites. Currently, special interests will be paid to the dynamics and mechanics of polymer nanocomposites, the fracture mechanics of thermoplastics, and novel polymer membranes for gas separation. One of our targets is to design novel composite materials that can be applied to address emerging challenges in environment and energy, such as gas separation, desalination, batteries, and super capacitors.

Martin Crimp, Professor, Chemical Engineering and Materials Science
Professor Crimp's research interests are in the development and application of advanced electron microscopy characterization techniques as well as the study of deformation and fracture mechanisms of structural materials. His recent research programs include: (1) the characterization of heterogeneous deformation in titanium and titanium alloys using electron and atomic force microscopies as well as crystal plasticity finite element computer simulations; (2) the understanding of critical damage nucleation in body centered cubic metals; (3) the development of a femtosecond high brightness electron source for time resolved electron diffraction and imaging; (4) the development of an electron channeling approach to the mapping of plastic strains in polycrystalline materials.

Bruce E. Dale, University Distinguished Professor, Chemical Engineering and Materials Science
Prof. Dale's interests focus on developing the material basis for a sustainable society. He is trying to understand how we can sustainably produce fuels, chemicals and materials from renewable plant biomass. Recent collaborative scholarly work includes: 1) life cycle assessment of biofuels to identify areas that provide the most potential for environmental improvement, 2) developing processes to produce liquid fuels from recalcitrant portions of plant biomass, 3) coproducing animal feeds and biofuel feedstocks to help resolve the "food vs. fuel" issue and 4) developing logistical and processing systems to maximize the potential for rural economic development within functioning biofuel systems.

John Dorgan, David L. and Denies Lamp Endowed Chair Professor, Chemical Engineering and Material Science
John Dorgan is an expert in polymer materials science. His interests include polymer science with a particular emphasis on "green" polymers made from renewable resources. He has developed new computer simulation algorithms and theory to explain and understand the phenomena of molecular weight based migration in flowing polymers.

Lawrence T. Drzal, University Distinguished Professor, Chemical Engineering and Materials Science, and Director, Composite Materials and Structures Center.
Professor Drzal's research includes: i) surfaces, interfaces and surface modification in composite materials and adhesively bonded joints; ii) synthesis, chemical and physical modification and processing of graphene nanoplatelets in polymers and composites; iii) multifunctional materials through incorporation of nanoparticles; iv) nanostructuring of materials for energy generation and storage and v) biobased natural fiber composite materials. During his career Dr. Drzal has published

over 325 research papers and have been awarded 31 patents. He has mentored 30 Master's, 30 Doctoral, and 38 Post-Doctoral students during the last 25 years at MSU. Dr. Drzal serves on the editorial board of five journals and serves on numerous government committees. His research has received College, University, Government and Professional Society Awards. He has been awarded the rank of Fellow in five professional societies and elected to membership in the European Academy of Sciences.

Phillip Duxbury, Professor; Adjunct Professor, Chemical Engineering and Material Science

Current interests include: (i) phase behavior of polymer-nanoparticle mixtures with applications to organic solar cells; (ii) phase behavior of nanoparticle-lipid bilayer systems with applications to nanotoxicology; (iii) finding the atomic structure of non-crystalline materials, such as isolated nanoparticles and complex molecules, involving the definition and solution of novel inverse problems; (iv) ultrafast nanocrystallography and applications to ultrafast processes in materials. An ongoing basic theory interest is phase transitions in complex, frustrated networks, particularly problems that lie at the interface between combinatorial optimization and statistical physics such as spin glass, K-SAT and MIS problems.

Anne Eisenlohr, Teaching Specialist, Chemical Engineering and Material Science
Teaching - Undergraduate Materials Science and Engineering courses.

Phillip Eisenlohr, Associate Professor, Chemical Engineering and Material Science

His research interests include computational materials science, mechanical behavior and deformation resistance, crystal plasticity, creep, grain boundaries and interfaces, scale-bridging simulation, finite element modeling, spectral methods, dislocation dynamics.

Maddalena Fanelli, Teaching Specialist, Chemical Engineering and Material Science

Dr. Fanelli's research experience and interests include polymer processing, colloidal phenomena and microchannel technology. As teaching specialist, she is currently concentrating on undergraduate laboratory instruction in the department of Chemical Engineering and Materials Science. She is a member of the American Institute of Chemical Engineers, the American Chemical Society, and the American Society of Engineering Education.

Elias Garratt, Assistant Professor, Chemical Engineering and Material Science

Elias Garratt is a physicist by training. His work explores relationships between the structures of matter at the micro- and nano-scales to their properties as applied to transformative technologies like diamond electronics.

Martin Hawley, Professor, Chemical Engineering and Material Science

Research interests include: Carbon nanotube synthesis; chemical kinetics; reactor design; transport phenomena; enzyme kinetics; plasma reactions; electromagnetic processing of materials; petrochemical processes; biomass conversion processes.

David Hodge, Associate Professor, Chemical Engineering and Materials Science, Biosystems and Agricultural Engineering

Dr. Hodge's research addresses the challenges associated with the deconstruction and conversion of plant cell wall biopolymers and food crops to renewable energy, products, and fuels by chemical, biochemical, and physical means. Examples of recent collaborative, scholarly work include: (1) improving oxidative chemical pretreatments using catalysis with Cu-diimines, (2) characterizing the impacts of chemical pretreatments on the properties of lignin and the extractability/accessibility of non-cellulose polysaccharide properties, and (3) understanding how the water-cell wall environment influences the cell wall's susceptibility to enzymatic deconstruction.

K Jayaraman, Professor, Chemical Engineering and Materials Science

Prof. Jayaraman's research interest includes Melt processing, rheology and microstructure of polymer blends, particulate polymer composites and polymer nanocomposites; extensional flow measurements and orientation of polymer composites in processing below and above the melting point.

Stephen Kamin, Teaching Specialist, Chemical Engineering and Material Science

Teaching - Undergraduate Chemical Engineering courses. He has Industrial Experience in Silicone Manufacturing Processes.

Seungdo Kim, Associate Professor, Chemical Engineering and Material Science

Prof. Kim's research interests include Life cycle assessment, bioenergy, biopolymers, life cycle inventory database, industrial ecology.

Wei Lai, Associate Professor, Chemical Engineering and Materials Science

Wei Lai obtained his PhD in Materials Science at California Institute of Technology. Before joining MSU in 2009, he was a postdoctoral associate at Massachusetts Institute of Technology. His research interests focus on the study of materials for energy through integrated experimental and computational efforts.

Ilsoon Lee, Associate Professor, Chemical Engineering and Materials Science

Prof. Lee's research interests include polymer surfaces and interfaces, molecular self-assembly, nanostructured biomimetic interfaces, biosensors, biomaterials, functional thin film, coatings, adsorption, adhesion and particles.

Andre Lee, Associate Professor, Chemical Engineering and Materials Science

Prof. Lee's research interests are in nanostructured chemicals. His recent collaborative scholarly works includes: (1) Enhancing service reliability of advanced electronic packing materials; (2) Developing thermosetting polymer matrix nano-composites for aerospace applications; and (3) 3D synchrotron X-ray characterization of advanced materials. He is a member of Society of Rheology, The Materials Society, Materials Research Society and American Chemical Society.

Carl Lira, Associate Professor, Chemical Engineering

Carl Lira's works in the area of thermodynamic properties of fluids for phase equilibria and reaction kinetics. He collaborates extensively with the MSU reactive distillation facility. He is active in the development of bioderived chemicals and fuels using experiments and molecular simulations. In the fuels area, he works on the properties of blends of bioderived additives to petroleum fuels.

Richard Lunt, Johansen Crosby Endowed Associate Professor, Chemical Engineering and Materials Science and Assistant Adjunct in Physics and Astronomy.

His research interests include: 1) Alternative Energy and Utilization, 2) Excitonic Electronics and Photovoltaics, 3) Light Emitting Devices, and 4) Vapor-Phase Deposition and Quasi-Epitaxy. He has worked extensively in the field of excitonic electronics for nearly a decade, winning the GPEC Solar Energy Innovation Award in 2009, the MassCEC (Clean Energy Center) Award in 2011, has been recognized by the American Physical Society (APS) as an invited organizer of the Organic and Photonics Session at the 2012 and 2013 March meetings, and recently co-founded the company Ubiquitous Energy Inc. to commercialize excitonic solar cells.

Sophia Lunt, Assistant Professor, Chemical Engineering and Materials Science

Sophia earned her Ph.D. in chemistry from Princeton University and has received these past awards,

2016 AACR-Incyte NextGen Grant for Transformative Cancer Research

2015 DoD CDMRP Breast Cancer Research Program (BCRP) Breakthrough Award

2015 Mayo Clinic Metabolomics Research Core Pilot and Feasibility Award

2014 Best Oral Presentation Award, Michigan Physiological Society

2012 DoD CDMRP PRCRP Visionary Postdoctoral Fellowship Award

Darren Mason, Adjunct Associate Professor, Chemical Engineering and Materials Science

His research interests includes Mathematics. He is serving as an editorial member and reviewer of several international reputed journals. Dr. Darren E Mason is the member of many international affiliations. He has successfully completed his Administrative responsibilities. He has authored of many research articles/books related to Mathematics.

Nathan P. Mellott, Teaching Specialist, Chemical Engineering and Materials Science

Teaching: Undergraduate and Graduate Materials Science and Engineering Courses Research: Materials and Surface Characterization; Glass Processing, Structure, and Durability; Bioceramics; Multifunctional Oxide Thin Films; Sol-Gel Science and Technology.

Dennis J. Miller, Professor, Chemical Engineering and Materials Science

Dr. Miller's research interests involve catalysis, reaction characterization, reactor design, and reactive separations applied to renewable bio-based chemicals and biofuels. Current projects in catalysis include advanced biofuels for military applications, value addition to ethanol, and production of specialty chemicals for consumer products. He directs the MSU Reactive Distillation Facility at MBI, which houses pilot-scale process equipment systems for testing and demonstration of new separation technologies. Dr. Miller is an inventor on 20 US patents and works actively with industry on process development and design.

Donald Morelli, Chairperson Professor, Chemical Engineering and Materials Science, Adjunct Professor, Physics and Astronomy

Prof. Morelli's research interests are in the electronic, thermal, and magnetic properties of materials with special emphasis on semiconductors and materials for energy conversion. Recent work has focused on 1) discovery, synthesis, and understanding of thermoelectric materials displaying contraindicated physical properties; 2) development of new sources of earth-abundant thermoelectrics for power generation and solid state heating and cooling; 3) understanding the nature of anharmonicity in solids and its relation to the origins of thermal resistivity. He is a Fellow of the American Physical Society, Associate Editor of the Journal of Electronic Materials, and Director of the MSU-led and DOE-funded Energy Frontier Research Center, "Revolutionary Materials for Solid State Energy Conversion."

Ramani Narayan, University Distinguished Professor, Chemical Engineering and Materials Science

Ramani Narayan is University Distinguished Professor in the Department of Chemical Engineering & Materials Science at Michigan State University. He has 150 refereed publications in leading journals to his credit, 28 issued patents, edited three books and one expert dossier in the area of bio-based polymeric materials. His research encompasses design & engineering of sustainable, biobased products, biodegradable plastics and polymers, biofiber reinforced composites, reactive extrusion polymerization and processing, studies in plastic end-of-life options like biodegradation and composting.

Jason Nicholas, Associate Professor, Chemical Engineering and Materials Science

Professor Nicholas's interests include 1) the influence of strain on the electrochemical performance and microstructural evolution of alternative energy materials and 2) the development of cost-effective materials/processing routes for high efficiency chemical-to-electrical energy conversion/storage devices (batteries, fuel cells, chemical separators, pseudo-capacitors, etc) and environmentally-aware devices (electro-chromic coatings, chemical sensors, and chemical actuators). His recent work includes the 1) fabrication and modeling of high-performance, low-temperature solid oxide fuel cell cathodes, 2) *in situ* observations of the stress evolution of constrained porous media, and 3) a novel curvature relaxation method for the determination of oxygen surface exchange coefficients in mechano-chemically active materials. His research expertise has been recognized by the Electrochemical Society (ECS) as an invited organizer of the Spring 2014 "Mechanical-Electrochemical Coupling in Energy Related Materials and Devices" Symposium. He is also the organizer of the annual Michigan State Girl Scout Science Technology Engineering and Math (STEM) Visit Day, and the founder of the Chemical Engineering and Materials Science Graduate Student Association (CHEMS-GSA).

Robert Y. Ofoli, Associate Professor, Chemical Engineering and Materials Science

Professor Ofoli's lab focuses on the synthesis, characterization and use of nanoscale catalysts and catalyst complexes for production of chemicals and high-density liquid fuels from biorenewables. Our goal is to integrate rational catalyst design and synthesis, ex-situ and in-situ characterization, catalytic assessment, and modeling and simulation to understand structure-function relationships. This approach is currently being used in three important research areas: a) transformation of biorenewables to chemicals and high-density liquid fuels, b) development of a photosynthetic water oxidation mimic to produce hydrogen on demand, and c) quantized charging of nanoparticles (as a means of solar energy storage) for hydrogen production. We are also interested in exploring the potential of combining the photosynthetic mimic with carbon dioxide sequestration to produce commodity chemicals and liquid fuels.

Rebecca Ong, Research Assistant, Chemical Engineering and Materials Science

Lars Peereboom, Visiting Research Associate, Chemical Engineering and Materials Science

His research interests include: reaction engineering, catalysis; chemicals from renewable feedstocks; hydrogenation; reactive separations; analytical method development; instrument modification, repair, design and construction of lab and pilot-scale reactors and separation columns; development and optimization of innovative reaction pathways in the synthesis of chiral four- and five-carbon drug precursors.

Charles Petty, Professor, Chemical Engineering and Materials Science

His research interests include hydrodynamic and reactor stability theory; solid-fluid separations; turbulent transport phenomena.

Vijayarathi Ponnambalam, Research Associate, Chemical Engineering and Materials Science

Dr. Vijay Ponnambalam (Ponns) is currently a Senior Research Associate working with Prof. Don Morelli in the Dept. of Chemical Engineering & Materials Science, Michigan State University. His expertise is in the broader area of materials synthesis & characterization with current focus on new single crystalline and high density polycrystalline thermoelectric.

Yue Qi, Associate Professor, Chemical Engineering and Materials Science

Prof. Qi's research interests include multi-scale modeling, electrical-chemical-mechanical coupling in Li-ion battery and fuel cell materials, and transport in solid electrolytes, interfaces, and grain boundaries. She won the 1999 Feynman Prize in Nanotechnology for Theory along with William Goddard and Tahir Cagin for "work in modeling the operation of molecular machine designs.

Paul Satoh, Adjunct Professor, Chemical Engineering and Materials Science

Paul does research in Biochemistry, Pharmacology and Chemical Biology. Their most recent publication is 'Complement titration by rectilinear attenuation and attempts at its automatization.'

Erik M. Shapiro, Associate Professor, Chemical Engineering and Materials Science

His research program continues to revolve around molecular and cellular MRI, particularly in the use of MRI to track specific cell populations. This includes cell transplants as well as immune cells. Furthermore, his lab emphasizes the fabrication of novel biocompatible nanomaterials for use in MRI investigations.

S. Patrick Walton, C. Robert and Kathryn M. Weir Associate Professor; Associate Chair, Chemical Engineering and Materials Science

Professor Walton's lab, the Applied Biomolecular Engineering Laboratory (ABEL), is focused on the analysis and application of nucleic acid-based technologies. Our goals are the understanding of critical biophysical and biochemical parameters involved in these processes and, in turn, the tuning of these parameters to achieve an improved technology. The current foci of the lab fall into two categories: i) mechanistic analysis of RNA interference (RNAi) and ii) parallel analytical platforms for cellular molecules. Specific ongoing projects include:

- 1.) *in vitro* interactions of RNAs with human RNAi pathway proteins.
- 2.) Quantitative, parallel measurements of transcription factor levels.

Tim Whitehead, Associate Professor, Chemical Engineering and Materials Science, Biosystems and Agricultural Engineering

Prof. Whitehead's interests are in the computer-aided design of biological parts and organisms. Two main applications for this research are in the development of protein anti-virals and in the conversion of biomass to drop-in transportation fuels and chemicals. His recent scholarly work includes the design and optimization of small proteins that target and inhibit multiple pandemic strains of the Influenza virus (published in Science and Nature Biotechnology, highlighted by NPR). He has just received a federal grant outlining fundamentally new ways to deconstruct biomass into fermentable substrates.

Alexandra Zevalkink, Assistant Professor, Chemical Engineering and Materials Science

Her research interests include Crystal growth of thermoelectric materials, structural chemistry in complex semiconductors, anisotropic thermal and electronic transport, high temperature thermal expansion and elastic properties.

Civil and Environmental Engineering

Annick Anctil, Assistant Professor, Civil and Environmental Engineering

Research focus in pollution prevention has shifted from treatment and control to design for the environment, which uses a holistic approach to ensure that all stages of the life cycle of a product or system are environmentally, economically and socially sustainable. Dr. Anctil uses proactive sustainability assessment to reduce the environmental impact of new technologies. Process based life-cycle assessment (LCA) is used to identify critical steps in current technologies and guide greener alternatives by combining theoretical environmental assessment and experimental work. Evaluating the environmental impact of photovoltaics technologies constitutes the core of her research.

Gilbert Y. Baladi, Ph.D., P.E., Professor, Department of Civil and Environmental Engineering, Advisor, MSU Chapter, Chi Epsilon Civil Engineering Honor Society

Professor Baladi's interests are in the areas of characterization of composite engineering materials used in transportation networks and building foundations. Specific research interests include emphasis on the fatigue and plastic properties of soils, unbounded materials, and asphalt pavements. Current research in these areas focuses on the behavior of soil subgrades and asphalt pavements under heavy vehicular loads. His research also includes the development of pavement performance prediction models and the back-calculation of engineering properties of layered systems. He is also quite active in technology transfer activities, managing and coordinating training courses for the Federal Highway Administration and the World Bank.

Rigoberto Burgueño, Professor Civil and Environmental Engineering/Adjunct Professor

Mechanical Engineering, Civil and Environmental Engineering.

His research interests include: development of mechanical metamaterials and mechanical devices using elastic instabilities, hybrid nano- and micro-structured material systems, composite materials and structures, multiscale modeling, solid and structural mechanics, experimental characterization of materials and structures, inelastic response of concrete structures, and earthquake engineering. His research has been funded by the National Science Foundation, the Federal Highway Administration, the Michigan Department of Transportation and the Precast/Prestressed Concrete Institute.

Karim Chatti, Professor, Civil and Environmental Engineering

Current research includes the investigation of design and construction factors on the response and performance of new flexible and rigid pavements, the effect of heavy trucks with large axle groups on pavement performance, development of improved mechanistically based models to predict pavement performance, the development of surface profile roughness diagnosis tools for PMS application, the development of pavement surface roughness thresholds for the preventive maintenance of pavements, analyzing pavement distress and roughness data for pavement management applications, non-destructive pavement testing and dynamic back calculation of flexible and rigid pavement parameters, and effectiveness of preventive maintenance treatments.

Alison M. Cupples, Associate Professor, Civil and Environmental Engineering.

Dr. Cupples's research area is environmental microbiology. Her current research activities are focusing on microbial degradation of soil and water contaminants, dehalogenation of the groundwater contaminants tetrachloroethene and trichloroethene and their reductive dechlorination products, cis-dichloroethene and vinyl chloride. Dr. Cupples's research group is developing and using molecular methods (qPCR, SIP, TRFLP, LAMP) to identify and quantify the microorganisms responsible for environmental contaminants (vinyl chloride, BTEX, MTBE, dioxane, RDX), and investigate fate of pharmaceuticals during wastewater treatment and land application of biosolids.

Roozbeh Dargazany, Assistant Professor, Civil and Environmental Engineering

Roozbeh Dargazany's interests are in the area of the micro-mechanics of soft and bio-inspired materials. He is particularly interested in the mechanics of nano-composites such as elastomers, gels, biological tissues, and ultra-tough composites.

Simon Davies, Specialist-Research, Civil and Environmental Engineering

Kevin Eisenbeis, Director; Environmental Health & Safety; Consultant; Adjunct, Civil and Environmental Engineering

Timothy Gates, Associate Professor, Civil and Environmental Engineering

Dr. Gates' interests include the following subject areas: traffic engineering, traffic operations, traffic safety, driver behavior, and transportation economics. His recent research includes projects related to safety and operational impacts associated with raising speed limits, driver behavior at signalized intersections, safety impacts of intersection sight distance, safety performance and economic assessment of roadway design features, safety and operational impacts of highway rumble strips, highway work zone safety and operations, and pedestrian behavior and safety. Dr. Gates is a licensed professional engineer in Michigan and Wisconsin.

Mehrnaz Ghamami, Assistant Professor, Civil and Environmental Engineering

Dr. Ghamami's research is focused on transportation systems analysis, with applications in sustainable transportation, transit operations and travel reliability. She has developed a comprehensive modeling framework for analyzing various policy and planning issues related to plugin electric vehicles. She has also conducted research on urban travel reliability using consumer GPS data (funded by Transportation Research Board) and operational reliability of bus routes for Chicago Transit Authority (funded by Center for Commercialization of Innovative Transportation Technology).

Syed Waqar Haider, Associate Professor, Civil and Environmental Engineering

Dr. Haider's research interests are in the area of pavement material characterization, preservation, performance modeling, management, and rehabilitation. His current research has been focused on (a) the mechanistic characterization of recycled asphalt mixtures, (b) the rheological properties of aged and virgin binders, (c) the statistical modeling of axle load spectra for mechanistic-empirical pavement design, (d) the implementation of Superpave asphalt binder and mixture specifications, (e) the effectiveness of pavement preservation treatments, (f) the development of performance-related specifications & statistical quality control/assurance, (g) the use of advance/efficient statistical techniques in modeling pavement performance, (h) the non-destructive pavement evaluation techniques for fixing the existing road infrastructure, and (i) the calibration of performance models in mechanistic-empirical pavement design.

Mahmoodul Haq, Assistant Professor of CEE; Adjunct Assistant Professor of ECE and ME, Civil and Environmental Engineering

(a) Multi-material joining: Development of robust structural joints (adhesives, bolted, hybrid, reversible) consisting of composites and dissimilar materials with improved mechanical properties, enhanced damage resistance, along with sensing and healing capabilities. (b) Computational design of materials and structures: multi-scale simulations and establishing structure-property relationships and modeling of key phenomena of composites and hybrid materials. (c) Application of non-destructive tools for health monitoring and repair of structural joints and other structural components, including embedded fiber-optic sensors, guided wave sensing, digital image correlation, IR thermography, thermo-elastic stress analysis and optical techniques. (d) Development of tailorable, multi-functional, eco-friendly, and hybrid materials for aerospace, marine, defense, automotive and other structural applications. (e) Implementation of novel nanocomposite materials (graphene, nanotubes, nanoclays, etc.) to introduce multi-functionality in conventional engineering materials. (f) Development of design tools (charts, guidelines, thumb-rules) for novel materials and structural components through integration of simulations and experiments using innovative measurement and experimental techniques.

Syed Hashsham, Edwin Willits Professor, Civil and Environmental Engineering and Adjunct Professor in the Center for Microbial Ecology and Department of Plant, Soil and Microbial Sciences.

Dr. Hashsham's research focuses on environmental molecular biology and mathematical tools to address environmental engineering issues. Current research focuses on the development of DNA biochips for parallel detection of microorganisms important to drinking water and wastewater. Approaches for improved detection limit, sample concentration, probe design, and validation are of special interest. Dr. Hashsham is also interested in developing new tools to manage mixed microbial communities important to environmental biotechnology.

Anthony Ingle, Teaching Specialist, Civil and Environmental Engineering

Mr. Ingle's research interests include all areas of traffic and transportation engineering including geometric design, traffic flow and control, and traffic safety. Mr. Ingle is interested in traffic simulation modeling, and applications of this technology for planning and operational decision making. He is also interested in intelligent transportation systems (ITS) applications to transportation.

Dr. Venkatesh Kodur, University Distinguished Professor and Chairperson, Civil and Environmental Engineering

His research interests include: Evaluation of fire resistance of structural systems through large-scale fire experiments and numerical modeling and Characterization of materials under high temperature. His research contributions has led to the development of fundamental understanding on the fire behavior of material and structural systems and also resulted in numerous design approaches and innovative and cost-effective solutions for enhancing fire-resistance of structural systems. He has published over 260 peer-reviewed papers in journals and conferences, and has given numerous invited keynote presentations.

M. Emin Kutay, Associate Professor, Civil and Environmental Engineering

Dr. Kutay's background and interests are primarily on experimental and numerical investigation of fundamental material behavior of asphalt pavements and granular materials. His research focuses on improvement of the AASHTO superpave mix design, understanding and better prediction of fatigue cracking in asphalt pavements using state-of-the-art techniques such as the Viscoelastic Continuum Damage (VECD) Theory and development of tools to improve understanding of permanent deformation (rutting) characteristics of asphalt pavements. His other research interests include pavement surface characteristics such as smoothness, tire/pavement noise and splash/spray.

Rebecca H. Lahr, Assistant Professor, Civil and Environmental Engineering

Dr. Lahr is committed to students and education, passionate about research in environmental chemistry, motivated by service and outreach, and determined to protect drinking water supplies from the pressures of climate change, population growth, and resource extraction. Her research targets the need for detection, monitoring, and prevention of environmental pollution, with a focus on developing sensors for environmental pollutants, monitoring concentrations of environmental contaminants, examining processes involved in pollutant degradation, conducting mass balances concerning contaminant source and fate in the environment, and ultimately sharing scientific data to encourage sustainable-minded decision making. As the population of the Earth edges closer to its estimated carrying capacity, preservation and management of natural resources is becoming increasingly important to maintain public health.

Nizar Lajnef, Associate Professor, Civil Engineering

Dr. Lajnef's interests are in the area of sensors design for civil infrastructure and biomechanical systems, sensors networks design and implementation, nano-watt and self-powered sensors, and smart materials/composites/alloys and systems.

Shu-Guang Li, Professor, Civil and Environmental Engineering.

Prof. Li's research interests are in hydrology and water resources. His recent collaborative scholarly work includes: data intensive computing of complex hydrologic systems, multiscale modeling of groundwater-dependent ecosystems, and stochastic modeling of surface water and groundwater interaction. He is a Fellow of the American Society of Civil Engineers (ASCE) and the Geological Society of America (GSA).

David Long, Professor; Adjunct Professor, Civil and Environmental Engineering

His research interests include groundwater, rivers, lakes, oceans, sediments (modern and ancient), soils, and biologic material. In addition, he is very interested in linking knowledge of microbiological processes to geochemical processes and models such as PHREEQC.

Weiyi Lu, Assistant Professor, Civil and Environmental Engineering

Dr. Lu's research interests include synthesis, characterization, and novel application of advanced nanomaterials and composites in engineering structures; advanced protection/damping materials, structures, and mechanisms; experimental investigation on high-strain-rate behavior of soft materials/composites; Solid-nanofluid interactions; multifunctional materials such as next generation battery systems for electric vehicles (EV); and advanced biomaterials.

Phanikumar Mantha, Professor/Associate Chair for Graduate Studies, Civil & Environmental Engineering

Research interests in Dr. Mantha's group are centered on water (quantity and quality) and environmental flow and transport processes. Recent research addressed questions involving the fate and transport of chemical and biological agents in different hydrologic units in the Great Lakes region of North America (watersheds, rivers and streams, lakes and groundwater). Two general

research themes of current interest are: (a) Integrated hydrologic modeling and (b) Environmental fluid mechanics.

Susan Masten, Professor/Associate Chair for Undergraduate Studies, Civil and Environmental Engineering

Professor Masten's research involves the use of chemical oxidants for the remediation of soils, water, and leachates contaminated with hazardous organic chemicals. Her research is presently focused on the in-situ use of gaseous ozone to oxidize residual contaminant in saturated soils using ozone sparing and in unsaturated soils using soil venting. Dr. Masten is also very interested in evaluating the toxicity of the by-products of chemical oxidation processes as measured by gap junction intercellular communication. Work has focused on the ozonation and chlorination of several pesticides, including atrazine, alachlor, and lindane and on the PAHs, especially pyrene. Current work is being conducted to identify the by-products formed upon the ozonation of several PAHs and to assess their toxicity.

Sharlissa Moore, Assistant Professor, Civil and Environmental Engineering

Her teaching and research interests focus on the social, policy, equity, and security dimensions of energy systems, particularly those that cross nation-state borders and are undergoing dramatic change. Sharlissa is developing research collaborations in the College of Engineering to study the social and governance aspects of emerging energy technologies.

Yadu Pokhrel, Assistant Professor, Civil and Environmental Engineering

Dr. Pokhrel's research interests are focused on improving the understanding of the changes in the global/regional terrestrial water cycle in response to the combined effects of human activities and climate change. In particular, the changes in various components of the hydrological cycle, as caused directly by human activities such as land-use change, reservoir operation and large-scale diversion of water, irrigation, and groundwater pumping, constitute the foundation of his research interest. The primary focus of his research is on representing these human factors into global/regional hydrologic, climate, and earth system models in order to develop integrated hydrological/water resources assessment models to study human impacts on the water cycle and the associated impacts to and feedback from the climate system; he integrates various in-situ and satellite-based observations within these models to address problems related to climate change and water resources and agricultural sustainability.

Parviz Soroushian, Professor, Civil and Environmental Engineering

Professor Soroushian's research is on advanced structural, protective and functional materials. He is known for his expertise in concrete and cement composites. He has also made major innovations, in the field of smart, nano-structured and composite materials and protective coatings.

Vlad Tarabara, Professor, Environmental Engineering and Associate Director, Environmental Science and Policy Program

Dr. Volodymyr Tarabara joined MSU and the Department of Civil and Environmental Engineering in 2004. His research interests are in the interdisciplinary area at the junction of colloid and interface science and separation science. Most of the current work focuses on membrane processes and materials with projects on emulsion separation, virus removal by porous membranes, and catalytic membrane reactors. Dr. Tarabara is a member of the Association of Environmental Engineering and Science Professors, International Water Association, and North American Membrane Society and serves as a Special Issues Editor of the ASCE Journal of Environmental Engineering. At MSU, he teaches courses on environmental transport and unit processes.

Thomas Voice, Associate Dean for Administrative Affairs; Professor, Civil and Environmental Engineering

Professor Voice's research involves the mass-transfer of chemical contaminants in systems of environmental interest, with emphasis on interactions between pollutants and soils, sediments, and suspended solids. Current research is focused on the environmental impact and remediation of terrestrial chemical spills. He is involved in research on water and waste treatment systems that utilize activated carbon absorption. Professor Voice maintains a strong secondary interest in the development of new and improved methods for chemical analysis.

Thomas F. Wolff, Associate Professor Emeritus, Department of Civil and Environmental Engineering and Associate Dean for Undergraduate Studies

His research interests include geotechnical; reliability analysis of dams, levees and hydraulic structures, probabilistic analysis and reliability-based design in geotechnical engineering; probabilistic slope stability analysis.

Irene Xagorarakis, Associate Professor, Civil and Environmental Engineering

Irene's research program is focused on water quality engineering, emphasizing protection of public health and prevention of waterborne disease. In particular, I am interested in emerging water contaminants (such as viruses) and their detection, occurrence, fate, removal, inactivation, and risk.

Imen Zaabar, Assistant Professor, Civil and Environmental Engineering

Dr. Zaabar's research interests are in the areas of pavement response and performance modeling, dynamics of pavements and truck-pavement interaction, pavement surface roughness, infrastructure sustainability and Surface Properties - Vehicle Interaction, pavement preservation, and characterization of asphalt concrete mixtures. Recent research has been focused on (i) models for estimating the effect of pavement surface condition on vehicle operating costs, (ii) infrastructure sustainability, (iii) Surface Properties - Vehicle Interaction, (iv) assessment of pavement acceptance criteria, (v) the effect of heavy trucks with large axle groups on pavement performance, (vi) the development of roughness diagnosis tools for PMS application, and (vii) dynamic backcalculation of flexible and rigid pavement parameters.

Ali Zockaie, Assistant Professor, Civil and Environmental Engineering

Dr. Zockaie's research foci are network modeling, and urban transportation planning. He has developed a framework for the reliability-based user equilibrium problem considering temporal and spatial links travel time correlation as part of his PhD dissertation. He has worked on preparing networks for simulation-based dynamic traffic assignments tools for different research projects with a good understanding of the application of these tools, analyzing simulation results, and extracting performance measures. Beside the network modeling experiences, he has conducted research on traffic flow theory, where he has integrated traffic flow theory concepts into the dynamic networks. Operation research and optimization is another field of his interest, which has led to several publications related to airline industry, facility location for alternative fuel vehicles, specifically electric vehicles. He has also engaged in some research on urban transportation planning and estimation of dynamic origin-destination travel demand through the integration of activity-based models and multi-modal dynamic microsimulation.

Computer Science and Engineering

H. Metin Aktulga, Assistant Professor, Computer Science and Engineering

My research interests are in the areas of high performance computing, applications of parallel computing, big data analytics and numerical linear algebra. I primarily work on the design and development of parallel algorithms, numerical methods and software systems that can harness the full potential of state-of-the-art computing platforms to address challenging problems in large scale scientific computations and big-data analytics problems. A distinguishing aspect of my research is the close collaborations that I have built with domain experts in a wide range of fields such as molecular modeling and simulation, computational materials science, nuclear physics.

Wolfgang Banzhaf, Prof, JR Koza Chair - Tenure System, Computer Science and Engineering

Wolfgang Banzhaf is the John R. Koza Chair for Genetic Programming and a professor in the Department of Computer Science and Engineering. His research interests are in the field of bio-inspired computing, notably evolutionary computation and complex adaptive systems. Studies of self-organization and the field of artificial life are of interest to him. He recently become more involved with network research as it applies to natural and man-made systems.

Joyce Chai, Professor, Computer Science and Engineering

Joyce Chai is a Professor in the Department of Computer Science and Engineering at Michigan State University. Prior to joining MSU in January 2003, she was a Research Staff Member at IBM T. J. Watson Research Center. She received a Ph.D. in Computer Science from Duke University in 1998. Her research interests include multimodal conversational systems, natural language processing, and intelligent user interfaces. She is a recipient of a National Science Foundation Career Award in 2004.

Betty Cheng, Professor, Computer Science and Engineering

Dr. Cheng's research and teaching interests include formal methods for software engineering, component-based software development, object-oriented analysis and design, embedded systems development, dynamically-adaptive systems, visualization, and distributed computing. She is a co-founder of the Software Engineering and Network Systems Laboratory that currently supports 6 faculty members and their graduate students. Her research has been funded by NSF, DARPA, NASA, ONR, EPA, USDA, and numerous industrial organizations.

Laura Dillon, Professor, Computer Science and Engineering

Laura's research interests center on formal methods for specification and analysis of concurrent software systems, programming languages, and software engineering. She is Vice Chair of the Association for Computing Machinery's Special Interest Group in Software Engineering (ACM SIGSOFT) and an ACM Distinguished Scientist. Laura is also active in broadening participation in computing. This year, she is General Co-Chair of the Grace Hopper Celebration of Computing, which is expected to be the largest ever gathering of technical women worldwide.

Wayne Dyksen, Director, Design Day; Professor, Computer Science and Engineering

Wayne Dyksen serves as an Associate Director of MATRIX, The Center for Humane, Arts, Letters, and Social Sciences OnLine. His research interests includes computational humanities, cyber security, web services, and high performance computing. Dyksen is a member of the Board of Advisors of the College of Information Technology of the United Arab Emirates University. He also serves as a member of the Strategic Partners Council of the Department of Computer Science at Calvin College.

Richard Enbody, Associate Professor, Computer Science and Engineering

Rich Enbody came to MSU in 1987 with a Ph.D. from the U. of Minnesota. Before graduate school he taught high school mathematics for six years. His B.A. was in Mathematics from Carleton College. His work at MSU has covered a variety of topics with many related to computer architecture such as parallel processing, caching, power and security. He holds two patents in nanotechnology devices with two more pending in security hardware.

Abdol Esfahanian, Associate Professor; Associate Chairperson, Computer Science and Engineering

Dr. Esfahanian joined MSU in 1983. His research interests include applied graph theory, computer networks, fault-tolerant computing, and web mining. He has published articles in journals such as IEEE Transactions on Computers, NETWORKS, Discrete Applied Mathematics, Graph Theory, and Parallel and Distributed Computing. From 1996 to 1999, he was an Associate Editor of NETWORKS, an international journal. He served as the department's graduate director for 10 years.

Anil K. Jain, University Distinguished Professor, Computer science & Engineering

Anil Jain's research interests include pattern recognition, computer vision and biometric recognition. His articles on biometrics have appeared in Scientific American, Nature, IEEE Spectrum, Scholarpedia, and MIT Technology Review. He has received a number of awards, including Guggenheim fellowship, Humboldt Research award, Fulbright fellowship, IEEE Computer Society Technical Achievement award (2003), W. Wallace McDowell award (2007), IAPR King-Sun Fu Prize (2008), and ICDM 2008 Research Contribution Award. He holds six patents and is the author of several books.

Sandeep Kulkarni, Professor, Computer Science and Engineering

Sandeep Kulkarni received his Ph.D. from Ohio State University in 1999, where he received a Presidential Fellowship and departmental award for outstanding research. His research interests include fault-tolerance, distributed systems, operating systems, networks, software engineering, security, and reliability. He has developed numerous tools for the design of fault-tolerant and secure computing systems.

Xiang-Yang Alex Liu, Professor, Computer Science and Engineering.

Alex Liu joined Michigan State University in 2006 after earning his Ph.D. from the Department of Computer Sciences at The University of Texas at Austin. He is the co-author of a number of papers published at conferences/journals such as Sigmetrics, PODC, ICNP, Infocom, DSN, ICDCS, TPDS. His research interests include networking, security, and systems. He won the 2004 IEEE & IFIP William C. Carter Award with the citation, "to recognize an individual who has made a significant contribution to the field of dependable computing through his or her graduate dissertation research".

Xiaoming Liu, Assistant Professor, Computer Science and Engineering

Xiaoming Liu earned his Ph.D degree in Electrical and Computer Engineering from Carnegie Mellon University in 2004. He received a B.E. degree from Beijing Information Technology Institute, China and a M.E. degree from Zhejiang University, China in 1997 and 2000 respectively, both in Computer Science. Prior to joining MSU, he was a research scientist at the Computer Vision Laboratory of GE Global Research. His research interests include computer vision, pattern recognition, machine learning, biometrics, human computer interface, etc.

Kevin J. Liu, Assistant Professor, Computer Science and Engineering

Prof. Liu's research interests include Computational biology and bioinformatics comparative genomics, phylogenomics, functional and phenotypic interpretation of genomes, large-scale phylogenetics at scales approaching the Tree of Life, multiple sequence alignment, population genetics.

Philip K. McKinley, Professor, Computer Science and Engineering and Faculty member, Ecology and Evolutionary Biology and Behavior Program

Philip K. McKinley received his Ph.D. degree in computer science from the University of Illinois at Urbana-Champaign. He was a member of technical staff at Bell Laboratories in Naperville, Illinois from 1982-1990. Dr. McKinley has served as an Associate Editor for IEEE Transactions on Parallel and Distributed Systems and was co-chair of the program committee for the 2003 IEEE International Conference on Distributed Computing Systems. His current research interests include Distributed systems, self-adaptive software, autonomic computing, adaptive middleware, group communication services, digital evolution, artificial life, overlay networks, and service composition.

Matt W. Mutka, Professor and Chairperson, Computer Science and Engineering

Central themes in Matt Mutka's research have been the design, performance evaluation, and implementation of resource management strategies for computer networks, distributed systems, and real-time systems. Some of his research activity investigates cooperation and trust in ad hoc peer-to-peer networks, service discovery in pervasive computing systems, quality of service issues in wireless networks, and adaptive frameworks for portable real-time applications. He has worked on real-time system instrumentation and visualization, support for time constraints in parallel systems, bandwidth control strategies for multicast transmitted video, high performance web servers, and a variety of other resource management problems.

Charles Ofria, Professor, Computer Science and Engineering

Charles Ofria director of the Digital Evolution Laboratory. He conducts research on evolution in artificial systems and applies the results to problems in computer science and evolutionary biology. He developed Avida, a software-based research platform consisting of populations of 'digital organisms used in biological research. His work has been published in Science and Nature and his research has received international media attention in forums such as Discover Magazine, National Geographic, CNN, the BBC, New Scientist, and the New York Times.

Charles Owen, Associate Professor, Computer Science and Engineering

Charles Owen is director of the Media and Entertainment Technologies Laboratory and a member of the MSU Media, Interface, and Network Design (M.I.N.D.) Laboratory. His research interests include multimedia systems, multimedia databases and information retrieval, image and signal processing, and multimedia authoring systems.

William Punch, Associate Professor, Computer Science and Engineering and Director of the MSU High Performance Computing Center

William F. Punch is director of the MSU High Performance Computing Center and co-director of the Genetic Algorithms Research and Applications Group or GARAGe. His main interests are genetic algorithms and genetic programming, including theoretical issues (parallel GA/GP) and application issues (design, layout, scheduling, etc.). He also has active research in data mining, mostly focused on intelligent search approaches based on pattern-recognition techniques and GA/GP search.

Arun A. Ross, Professor, Computer Science and Engineering

Prior to joining the MSU Faculty in January 2013, Arun was with West Virginia University (WVU) as an Assistant Professor from 2003 to 2008 and as an Associate Professor from 2008 to 2012. Between 1996 and 1997, he was with the Design and Development Group of Tata Elxsi (India) Ltd., Bangalore, India. He also spent three summers (2000 - 2002) with the Imaging and Visualization Group of Siemens Corporate Research, Inc., Princeton, NJ, working on fingerprint recognition algorithms. His research interests include pattern recognition, classifier fusion, machine learning, computer vision, and biometrics.

George Stockman, Professor Emeritus, Computer Science and Engineering

George Stockman is a professor emeritus of Computer Science (1 Jan 2011) but is still doing research, reviewing and outreach. Interests include computer vision, image processing, graphics and artificial intelligence. Recent work has been in the modeling, recognition, and measurement of objects and has both theoretical and practical aspects. Teaching interests include algorithms, data structures, computer graphics and computer vision, and programming languages. Since 2007, I've been active with ITEC Lansing working with middle school students after school on Scratch, MATLAB, LEGO, etc.

Yanni Sun, Associate Professor, Computer Science and Engineering

Yanni Sun is an assistant professor in the Department of Computer Science and Engineering. She earned her Ph.D. in computer science from Washington University in St. Louis. Sun's research interests are bioinformatics, computational biology, and developing algorithms and software to solve problems motivated by molecular biology. Her recent focus is efficient algorithms for discovering protein and noncoding RNA signals hidden in large-scale databases.

Pang-Ning Tan, Associate Professor, Computer Science and Engineering

His research interests span a broad range of data mining problems, from pattern discovery (association analysis, anomaly detection, and cluster analysis) to predictive modeling. In addition to addressing fundamental problems in data mining, he is also interested in applying data mining techniques to various application domains including climate and Earth sciences, social and information networks, botnet and web spam detection, and medical informatics. His research has been supported by the National Science Foundation, Office of Naval Research, Army Research Office, National Aeronautics and Space Administration, and Michigan State University.

Jiliang Tang, Assistant Professor, Computer Science and Engineering

He has broad interests in social computing, data mining and machine learning and is directing the Data Science and Engineering Lab. He was the recipients of the Best Paper Award in KDD2016, the runner up of the Best KDD Dissertation Award in 2015, Dean's Dissertation Award and the best paper shortlist of WSDM2013. He has published his research in highly ranked journals and top conference proceedings, which received thousands of citations (Google Scholar) and extensive media coverage.

Yiying Tong, Associate Professor, Computer Science and Engineering

His research focuses on discrete geometric modeling, physically-based simulation/animation, and discrete differential geometry. His research interests also include the applications of differential geometry in face recognition, molecular surface computation, medical imaging, and other related areas.

Eric Torng, Associate Professor; Graduate Director, Computer Science and Engineering
Eric Torng is a member of the Digital Evolution Laboratory and a founding member of the Quantitative Biology and Modeling Initiative at Michigan State University. He serves as graduate director for the Department of Computer Science and Engineering. His research interests include algorithms, on-line algorithms, scheduling, computational complexity, TCAM, packet processing.

Guan-Hua (Scott) Tu, Assistant Professor, Computer Science and Engineering
His research interests include computer and network security, mobile networks and systems, and wireless networking.

Juyang Weng, Professor, Computer Science and Engineering
Juyang (John) Weng is a professor of the Department of Computer Science and Engineering at Michigan State University, a member of the MSU Cognitive Science Program and a member of the MSU Neuroscience Program. His research interests lie in the intersection of the general fields of computer science and engineering, brain science, and cognitive science. He is a co-founder of the Embodied Intelligence Laboratory. Weng is the author or coauthor of over two hundred research articles and book chapters.

Li Xiao, Associate Professor, Computer Science and Engineering.
Her research interests include distributed and networking systems, overlay systems and applications, wireless sensor networks, wireless mesh networks, system resource management, and design and implementations of experimental algorithms.

Guoliang Xing, Associate Professor, Department of Computer Science and Engineering
Guoliang Xing earned his D.Sc. ('06) and M.S. ('03) in computer science from Washington University in St. Louis. He received a B.S. in electrical engineering and M.S. in computer science from Xi'an Jiaotong University in 1998 and 2001, respectively. Prior to joining MSU, he was an assistant professor of computer science at the City University of Hong Kong. His research interests include wireless sensor networks, mobile computing, and networked embedded systems.

Electrical and Computer Engineering

John Albrecht, Associate Professor and Associate Chair for Research, Electrical and Computer Engineering / Chemical Engineering and Materials Science

Prof. Albrecht's research interests are in the area of semiconductor physics and electron devices. His recent collaborative scholarly work includes: (1) applications of integrated radio frequency electronics at millimeter and sub-millimeter wave frequencies; (2) advanced electro-thermal computational analysis methods for high power dissipation devices; and (3) full-wave electromagnetic interactions with solid-state devices at terahertz frequencies. He is a member of the American Physical Society. He is former program manager for compound semiconductor devices for radio frequency electronics at the Defense Advanced Research Projects Agency.

Dean Aslam, Professor, Electrical and Computer Engineering

Prof. Aslam is interested in the areas of (a) fabrication of carbon-based single-material BioMEMS and RFMEMS, (b) prosthetics and neural disorders, (c) technology assisted solar-energy systems, (d) mind-controlled robots, wall-climber robots and maple-seed robotic fliers, (e) energy scavenging from static charges, (f) using functionalized bricks with embedded intelligence (FBEI) to study dancing, cognitive training and bullying and (g) FBEIs for K-12 outreach, UG and graduate education, and workforce training.

Jes Asmussen, Emeritus, University Distinguished Professor, Richard M. Hong Professor of Electrical and Computer Engineering

Over the last fifty years, Prof. Asmussen has been pioneering the development of: (1) the fundamental knowledge and (2) the application of microwave discharges (MD). His activities have led to the discovery of how to efficiently couple to and control the MD phenomena over a large range of pressures and input power levels. He has applied this knowledge to new MD applications resulting in numerous inventions and microwave plasma devices or plasma machines. Among these are microwave: (1) ion and plasma sources and ion engines, (2) free radical sources, (3) electro-thermal thrusters and (4) plasma CVD diamond deposition machines. His current research interests are aligned to further develop these applications and to transfer these technologies into commercial products. For example, during the past twenty-five years he and his students have investigated the microwave plasma assisted deposition of polycrystalline and single crystalline diamonds. They have developed and patented microwave plasma processing machines and associated process methods that are currently in use in research labs and by private industries around the world.

Selin Aviyente, Professor and Associate Chair for Undergraduate Studies, Electrical and Computer Engineering

Her research focuses on the theory and applications of statistical signal processing, in particular non-stationary signal analysis. She is interested in developing methods for efficient signal representation, detection and classification. Dr. Aviyente is also interested in the applications of signal processing to biological signals such as the analysis of event related brain potentials. Her current research focuses on the study of the functional networks in the brain.

Virginia Ayres, Associate Professor, Electrical and Computer Engineering

Investigates both inorganic and organic nanostructures. The small physical dimensions of nanostructures result in new and fascinating localized and sometimes quantized interactions. At the nano (10⁻⁹ m) level, the distinction between organic and inorganic behavior can be reduced to fundamental interactions common to both. However, very different applications are enabled by different combinations of the same fundamentals! Our group investigates two combinations, biocompatibility between organic and inorganic nanostructures, and nanocircuits for applications

in harsh radiation and low temperature environments.

Shanker Balasubramaniam, University Distinguished Professor, Electrical and Computer Engineering, and Physics and Astronomy

His research interests include all aspects of computational electromagnetics, and electromagnetic wave propagation in complex media. He has authored/coauthored more than 70 journal articles and presented over 120 papers at conferences. He is a senior member of the IEEE and a full member of the United States National Committee (USNC) for the International Union for Radio Science (URSI) Commission B. He is also an Associate Editor for the IEEE Antennas and Wireless Propagation Letters (AWPL).

Sergey Baryshev, Assistant Professor, Electrical and Computer Engineering

His research interests in the fields of collective phenomena in mesoscale systems, sub-micrometer field- and photoemission electronics, physics of high-transition-temperature superconductor, and methods of electron microscopy.

Subir Biswas, Professor, Electrical and Computer Engineering

Subir's research interests include the broad area of wireless data networking, low-power network protocols, vehicular networks, on-body networks, and application-specific sensor networks. Research in Prof. Biswas' NeEWS laboratory spans across a wide range of embedded system design issues including resource-constrained network systems, embedded operating systems, network middleware, mobile content delivery, and application specific hardware and software subsystem design.

Prem Chahal, Associate Professor, Electrical and Computer Engineering

Prof. Chahal's Research interest in Terahertz (THz) and Millimeter-wave Electronics, IR Sensors, Microsystems Packaging, RF-MEMS, BioMEMS, and Flex Electronics.

Sunil Chakrapani, Assistant Professor, Electrical and Computer Engineering

Sunil Kishore Chakrapani brings his extensive experience in advanced ultrasonic approaches for nondestructive evaluation of composite structures to MSU. He has been researching nonlinear and linear ultrasonics, nondestructive material characterization, wave propagation in anisotropic media, and nondestructive evaluation of structures.

Shelia Cotten, Professor, Electrical and Computer Engineering

Prof. Cotten studies technology use across the life course and the social, educational, and health impacts of that use. She conducts large-scale community based intervention studies designed to use technology to enhance various aspects of quality of life.

Kalayanmoy Deb, Koenig Endowed Chair Professor for Electrical and Computer Engineering; Adjunct Faculty for Computer Science & Engineering and Mechanical Engineering

Computational optimization; optimal design; process optimization; optimal modeling and optimal system design; multi-objective optimization and multi-criterion decision analysis; large-scale optimization; evolutionary multi-objective optimization (EMO) for handling practicalities -- uncertainties, constraints, multi-modalities, noise, and mixed variables; meta-modeling in optimization; hybrid optimization algorithms using evolutionary and classical methods; evolutionary computation in search, optimization of control of engineering problems; multi-modal optimization; design of self-adaptive evolutionary algorithms; combinatorial optimization; computational intelligence; neural networks; fuzzy logic systems; machine learning; practical applications of optimization in science, engineering, finance and in multi-disciplinary domains.

John R. Deller, Jr., Professor, Electrical and Computer Engineering

His research interests include statistical signal processing with applications to speech and hearing, genomics, and other aspects of biomedicine. His work has been published in respected journals and conferences, and he has authored or co-authored three textbooks and contributed chapters to several research books. His tutorial paper "Tom, Dick, and Mary Discover the DFT" was awarded the IEEE Signal Processing Magazine Best Paper Award in 1998.

Yiming Deng, Associate Professor, Electrical and Computer Engineering

Yiming's current research focuses on high-resolution and multi-wave NDE sensing and imaging systems that involve development of novel nonintrusive sensors, high fidelity multi-physics modeling for understanding NDE imaging physics, and experimental validation with sensor prototyping for critical energy and transportation infrastructures.

Lixin Dong, Associate Professor, Electrical and Computer Engineering

Dr. Dong's main research interests include nanorobotics, nanoelectromechanical systems (NEMS), mechatronics, mechanochemistry, and nanobiomedical devices.

Qi Hua Fan, Associate Professor, Electrical and Computer Engineering

Biography/Research Expertise: Plasma Sources, Plasma-Material Interactions, Thin Film Solar Cells, Supercapacitors, Optical Thin Films, Functional Coatings, Electronic Materials and Semiconductor Devices.

Shanelle N. Foster, Assistant Professor, Electrical and Computer Engineering

Dr. Foster joined the Department of Electrical and Computer Engineering as an assistant professor in January 2014. She is one of two Directors in the Electrical Machines and Drives Laboratory. From 2009 to 2013, she served as project manager of the same laboratory. Her research interests include analysis, control, reliability and manufacturability of rotating and linear electrical machines and drives.

Erik Goodman, Professor Electrical and Computer Engineering/Adjunct Professor Mechanical Engineering

Goodman is Director of the BEACON Center for the Study of Evolution in Action, an NSF Science and Technology Center, which began operation in August, 2010. The center conducts multidisciplinary research on evolution going on in the lab and field, in "digital organisms" in the computer, and in evolutionary computation applied to solution of problems in engineering and computer science. Goodman's personal research centers on evolutionary computation, particularly heterogeneous and parallel genetic algorithms and genetic programming. He is a founder of Red Cedar Technology, Inc., which writes and supports design automation and optimization software for industry. He is also involved in information and communications technology research and outreach in Africa.

Timothy Grotjohn, Professor, Electrical and Computer Engineering

Grotjohn's research interests include the modeling, design, diagnostics, and applications of plasma-assisted materials processes and processing machines. A strong focus of his work is the use of models, including electromagnetic, plasma dynamic, and plasma chemistry models, for the design and control of microwave plasma reactors used for materials processing. Specific processes studied have included diamond chemical vapor deposition (CVD), amorphous carbon deposition, semiconductor etching, and microwave-generated plasma discharges operated as ion and radical sources. In coordination with the modeling studies are his plasma diagnostic studies. His recent work looks in particular at mini- and micro-scale plasma discharges and their application.

Ming Han, Associate Professor, Electrical and Computer Engineering

His research is on fiber-optic sensor devices and systems advances their use in a wide range of applications from non-destructive evaluation, structural health monitoring, industrial process control, to environmental monitoring and energy research.

Lee Harle, Assistant Professor, Electrical and Computer Engineering

Tim Hogan, Professor and Associate Chair for Graduate Studies, Electrical and Computer Engineering

Research focus is in electronic materials, including temperature dependent electrical conductivity, Seebeck coefficient, thermal conductivity, Hall effect, and current vs. voltage measurements for materials and devices. Areas of research have included single crystal diamond, thermoelectric materials, oxide nanowires, and surface enhanced Raman spectroscopy. Experimental techniques include pulsed laser deposition, laser micromachining, cleanroom procedures, solid state reactions, powder processing, spark plasma sintering, and high temperature high pressure pressing/annealing.

Mark Iwen, Assistant Professor, Electrical and Computer Engineering

My research interests include signal processing, computational harmonic analysis, and algorithms for the analysis of large and high dimensional data sets.

Linus Jacovides, Professor, Electrical and Computer Engineering

His research expertise includes electric propulsion, automotive electrical systems, alternative fuels and energy.

Hassan Khalil, University Distinguished Professor, Electrical and Computer Engineering

Principal research interests: robust and adaptive control of nonlinear systems, singular perturbation methods in control. He is currently a University Distinguished Professor of Electrical and Computer Engineering. He has published several papers on singular perturbation methods and nonlinear control.

Tongtong Li, Associate Professor, Electrical and Computer Engineering

Prof. Li's research interests lie in wireless security, cognitive networks, wireless sensor networks, cyber-physical systems, wireless communications, digital signal processing, and information theory. Current projects in Prof. Li's BAWC (Broadband Access and Wireless Communication) Lab include: highly efficient and reliable communication system design, multi-layer techniques for secure communications under hostile environments, secure cyber-physical communication systems, and security issues in cognitive networks.

Wen Li, Associate Professor, Associate Chair for Space Management, Public Relations and Special Initiatives Announcement, Electrical and Computer Engineering

Her research interests include MEMS/NEMS technologies and systems, micro sensors and actuators, biomimetic devices and systems, microfluidic and lab-on-chip systems, and microsystem integration and packaging technologies.

John Luginsland, Professor, Electrical and Computer Engineering

Prof. Luginsland's research interests are Laser & Optical Science, Plasma & Electro-Energetic Physics, High Power Microwave Source, Accelerators for Industrial and Medical Applications.

Nihar Mahapatra, Associate Professor, Electrical and Computer Engineering

His research interests include computer architecture & VLSI and parallel and high-performance computing. In these areas, he has published more than 50 papers in leading refereed journals, conferences, and workshops, and has also contributed invited papers.

Andrew Mason, Professor, Electrical and Computer Engineering

Dr. Mason research utilizes mixed-signal integrated circuits and microfabrication to address challenges in microsystem development for biochemical, neural, and environmental sensing applications. Current projects include high-resolution, low-power, bioelectrochemical interrogation circuits; adaptive chemical sensor interface circuits; post-CMOS fabrication of electrochemical sensor arrays; and implantable mixed-signal integrated circuits for signal processing of wireless neural recordings. Dr. Mason is a Senior Member of the IEEE, an Associate Editor for IEEE Transactions on Biomedical Circuits and Systems (TBCAS), and a General Chair of the 2011 IEEE Biomedical Circuits and Systems Conference. He teaches courses in the area of microelectronics and biomedical engineering, including VLSI design, microprocessor systems, and biomedical instrumentation.

Robert J. McGough, Associate Professor, Electrical and Computer Engineering

His research interests include biomedical ultrasonics and electromagnetics, thermal therapy, targeted drug delivery, and medical imaging. He is a member of IEEE (UFFC and EMB Societies), the Society for Thermal Medicine, the Acoustical Society of America, and the International Society for Therapeutic Ultrasound.

Joydeep Mitra, Associate Professor Electrical and Computer Engineering/Adjunct Professor Mechanical Engineering

His research interests include power system reliability and security, and distributed and renewable energy resource planning. He has received research support from electric utilities, Sandia National Laboratories, the Department of Energy, and the National Science Foundation, including an NSF CAREER Award. He is a senior member of the IEEE and contributes to the Power and Energy Society, the Industrial Applications Society, and the Standards Association.

Daniel Morris, Associate Professor, Electrical and Computer Engineering

His research interests include 3D Computer Vision, multi-frame target tracking and pose estimation, LIDAR and range sensing, object detection and categorization.

Ramakrishna Mukkamala, Professor, Electrical and Computer Engineering

Ramakrishna Mukkamala is a cardiovascular researcher and signal processing instructor. His research interests include biomedical signal processing and system identification, physiologic modeling, physiologic sensing, cardiovascular physiology, and patient monitoring

Jeffrey Nanzer, Assistant Professor, Electrical and Computer Engineering

Jeffrey Nanzer's research is focused on microwave and millimeter-wave systems, radar, antennas, and electromagnetics.

John Papapolymerou, Chairperson/MSU Foundation Professor, Electrical and Computer Engineering

John Papapolymerou's research interests are in the areas of RF/microwave/mm-wave/THz circuits, antennas and packaging for wireless communication systems, sensors and radars. His current projects include the utilization of additive manufacturing techniques for three-dimensional RF circuits and modules, the development of cost effective packaged RF modules for high power applications, as well as the development of thin nanomagnetic materials for high frequency

applications.

Fang Z. Peng, University Distinguished Professor, Electrical and Computer Engineering
His principle scholarly interests include power electronics, motor drives, hybrid electric vehicles, and renewable energy interface systems. Peng is also the director of the MSU Power Electronics and Motor Drives Laboratory. Electronics focuses on advanced R&D on power conversion technology and motor control for renewable energy, utility and transportation applications.

Percy Pierre, Professor, Electrical and Computer Engineering
Directs several programs to recruit, retain, and graduate domestic graduate students in the College of Engineering with an emphasis on underrepresented groups. He collaborates with other faculty members in the College of Engineering helping to build research programs and research centers. His specific research interests are in the area of applications of stochastic models in engineering systems.

Chunqi Qian, Assistant Professor-Tenure System, Electrical and Computer Engineering
His research focuses on the development of advanced detection technologies for Magnetic Resonance Imaging and for biosensors in general. These detection technologies are subsequently utilized to evaluate the efficacy of various therapeutic strategies for cardiovascular, kidney and neurodegenerative diseases.

Hayder Radha, Professor, Electrical and Computer Engineering
Professor Radha's research areas are coding and communications; image and video compression; image processing; multimedia communications over packet networks; video coding and communications over the Internet and wireless networks; modeling and analysis of the stochastic behavior of communication networks; wavelet, subband, and multiresolution coding.

Kunwar Rajendra, Adjunct Professor, Electrical and Computer Engineering
Kunwar's research interests include Intelligent Transportation Systems, including Advanced Transportation Systems (ATMS), Advanced Traveler Information Systems (ATIS), Commercial Vehicles Operations (CVO), Vehicle Infrastructure Integration (VII), Systems Analysis, Operations, International Border Crossing Systems, Homeland Security systems, International issues in Transportation including safety, tele-communications and congestion.

Donnie Reinhard, Emeritus Professor, Electrical and Computer Engineering
His research is in the area of electronic and optical materials and devices, including microstructures. Particular emphasis is on the synthesis of diamond and applications of diamond.

Jian Ren, Associate Professor, Electrical and Computer Engineering
His research interests are in the areas of wireless and wireline network security, computer system security, cryptographic primitives, sequence design, error-control coding and information theory.

Aljoscha Roch, Assistant Professor, Electrical and Computer Engineering
His research interests lie in 3D printing, Printing techniques, Ink- development, Physics, UV-Vis-NIR Spectroscopy, Raman, carbon nano materials, Nanotechnology, carbon nanotubes, graphene, conducting polymers, thermoelectrics, energy harvesting, energy storage.

Edward J. Rothwell, Professor, Electrical and Computer Engineering
Prof. Rothwell's research interests are Antennas, scattering, radar target identification, measurement of the electromagnetic properties of materials, electromagnetic theory.

Fathi Salem, Professor, Electrical and Computer Engineering

Dr. Salem's current research interests include: Neural Networks and Learning Systems, Blind Signal Deconvolution and Extraction, Dynamical Systems and Chaos, Integrated CMOS Sensing and Processing.

Thomas Schuelke, Professor and Center Executive Director, Electrical and Computer Engineering

Prof. Schuelke's research addresses thin film coating technologies for industrial applications. A particular focus is on diamond and diamond-like carbon materials, plasma deposition processes and systems. Current projects work on energy efficient windows, energy storage, transportation safety, friction, wear and corrosion challenges in manufacturing and biomedical fields, and diamond applications such as power electronics and electrochemical sensing.

Nelson Sepúlveda, Associate Professor Electrical and Computer Engineering/Adjunct Professor Mechanical Engineering

Prof. Sepúlveda's research interests are micro and nanometer-sized sensors and actuators (or transducers), characterization of smart and multifunctional materials and their integration in microsystems.

Vaibhav Srivastava, Assistant Professor, Electrical and Computer Engineering

Prof. Srivastava's research interests include shared human-machine autonomy, networked multi-agent systems, and mathematical neuroscience.

Elias Strangas, Professor, Electrical and Computer Engineering

Prof. Strangas research interests are electrical machinery, finite-element methods for electromagnetic fields, electrical drives, and power electronics.

Antonello Tamburrino, Professor, Electrical and Computer Engineering

His research interests are in the broad areas of (i) Electromagnetic Imaging and Inverse Problems and (ii) Computational Electromagnetism. In the first field they include the development of 3D numerical methods for modelling NDE tests (forward problem), real-time imaging methods and algorithms (inverse problem) and sensors and system for NDE, with applications to aircraft and nuclear power plants NDE. In the second field they include the development of fast numerical methods for solving 3D electromagnetic problems, plasmonics, and 3D computational models in the presence of complex materials as composite materials, superconductors and hysteretic materials.

Xiaobo Tan, MSU Foundation Professor, Professor Electrical and Computer Engineering/Adjunct Professor Mechanical Engineering

Prof. Tan's research interests lie electroactive polymer sensors and actuators, biomimetic robotic fish, mobile sensing in aquatic environments, control of autonomous robotic swarms, modeling and control of hysteresis, embedded control systems.

Lalita Udpa, Professor, Electrical and Computer Engineering

Her research interests include various aspects of NDE, such as development of computational models for the forward problem in NDE, signal and image processing, pattern recognition and neural networks, and development of solution techniques for inverse problems. Her current projects include finite-element modeling of electromagnetic NDE methods applied to aircraft geometries, application of neural network and signal processing algorithms to NDE data, and development of image processing techniques for automated analysis of NDE and biomedical images.

Satish Udpa, Executive Vice President for Administrative Services Electrical and Computer Engineering

Former Dean of Engineering, Satish Udpa's research interests span the broad area of materials characterization and nondestructive evaluation (NDE). Work done by him to date in the area includes an extensive repertoire of forward models for simulating physical processes underlying several inspection techniques. Coupled with careful experimental work, such forward models can be used for designing new sensors, optimizing test conditions, estimating the probability of detection, assessing designs for inspectability and training inverse models for characterizing defects.

A. Cargi Ulusoy, Assistant Professor, Electrical and Computer Engineering

Cagri Ulusoy's research interests are in the broad area of high-frequency integrated circuits and systems. His main areas of specialization are BiCMOS frontend electronics for millimeter-wave systems, optoelectronic ICs for emerging Ethernet standards, as well as high-power amplifiers in SiGe and GaN technologies.

John P. Verboncoeur, Professor, Associate Dean for Research, Electrical and Computer Engineering

Prof. Verboncoeur's research interests include Computational plasma physics, electromagnetics, beam physics, high field effects including sheath formation, field emission, multipactor, and breakdown, laser-plasma interactions, plasma edge effects, transport, numerical methods, object-oriented techniques applied to scientific computing, visualization, plasma waves and boundary phenomena.

Chuan Wang, Assistant Professor, Electrical and Computer Engineering

His current focus areas of research include: 1) Flexible and stretchable electronics for displaying, sensing, and energy harvesting applications; 2) Ink formulation and printing process for low-cost, scalable microfabrication of flexible and stretchable electronics; and 3) High-performance nanoelectronics and optoelectronics using 2-dimensional semiconductors.

Bingsen Wang, Assistant Professor, Electrical and Computer Engineering

Prof. Wang current research interests focus on modeling and control of power electronic systems, power converter topologies, application of power electronics in renewable energy generation, and vector control of AC electric drive systems

Guowei Wei, Associate Professor, Electrical and Computer Engineering

Guowei's research interests include mathematical molecular biosciences, mathematical biophysics, bio-imaging, high order interface methods

Gregory Wierzba, Associate Professor, Electrical and Computer Engineering

His current research interests are in SPICE macromodeling of analog ICs, symbolic circuit analysis and audio engineering. Dr. Wierzba is a member of Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi, and Sigma Xi. He was the recipient of the 1986 Myril B. Reed Best Paper Award of the Midwest Symposium on Circuit and Systems.

Sangmin Yoo, Assistant Professor, Electrical and Computer Engineering

His research interest includes RF and analog/mixed-signal circuits and systems including high-efficiency transmitter architecture, software defined radio, RF power amplifier, and data converter for various applications such as communication, biomedical, wearable or implantable device, energy harvesting, and automotive system.

Mi Zhang, Assistant Professor, Electrical and Computer Engineering

Mi Zhang's research interests and efforts span the areas of ubiquitous computing, mobile sensing, wearable computing, embedded systems, pattern recognition, and applied machine learning. He is particularly interested in developing intelligent mobile sensing and ubiquitous computing technologies with a special focus on health care and medical applications. This fits well with a fascinating research field referred to as Mobile Health (mHealth), which aims to realize the vision of patient-centric personalized health care. Prior to joining MSU, he was a Postdoctoral Associate at Cornell University.

Peng Zhang, Assistant Professor, Electrical and Computer Engineering

Peng Zhang's research interests are in theory and modeling of nanoelectronics, electromagnetic fields and waves, plasmas, and accelerator technology. He has worked on electrical contacts, thin films, classical, ballistic, and quantum diodes, space-charge-limited current flows, beam-circuit interaction, microwave absorption on rough surfaces, multipactor and breakdown, slow wave structures, z-pinches, laser-plasma interaction, and more recently on vacuum nano devices, quantum tunneling plasmonic junctions, ultrafast photoemission, and novel miniaturized light sources.

Tom Zimmermann, Assistant Professor, Electrical and Computer Engineering

Tom's research interests lie in high-power high-frequency devices, first as post-doc and later on as research assistant professor. His teaching interests are in the field of biosensor-based biomedical systems and technology of diamond nanoelectromechanical structures, regulatory affairs of medical devices and international entrepreneurial development of biomedical products.

Mechanical Engineering

Patton Manuel Allison, Assistant Professor, Mechanical Engineering

Patton's research interests are Experimental studies of thermo-fluids and reacting flows, Turbulent combustion physics, Advancement and development of non-intrusive laser diagnostics, Application of alternative fuels in IC and gas turbine engines, Collaborative efforts between experimental and computational work and the improvement of computational modelling of combustion dynamics in practical devices.

Rebecca Anthony, Assistant Professor, Mechanical Engineering

Her research interests include plasmas for synthesis of semiconductor nanostructures, gas-phase processing and functionalization of nanostructures, and aerosol deposition of functional films. The applications for these nanostructures and materials range from energy-oriented devices like light-emitting diodes and solar cells to biological imaging agents.

Ron Averill, Associate Professor and Associate Chair for the Undergraduate Program, Mechanical Engineering

Ron Averill's research interests are computational mechanics, composite structures, laminated plate theory, crashworthiness, design optimization, finite element method.

Seungik Baek, Associate Professor, Mechanical Engineering

Prof. Baek's research interests are cardiovascular mechanics, vascular growth and remodeling, mechanobiology and tissue engineering, and computational and statistical interventions for vascular disease.

James Beck, Professor Emeritus, Mechanical Engineering

Professor Beck focuses his research on inverse problems in heat transfer.

Andre Benard, Associate Professor, Mechanical Engineering

Dr. Bénard's research interests include sustainable manufacturing and materials processing, multiphase flow and heat transfer (liquid/liquid and solid/liquid mixtures), and the design and modeling of new separation and processing equipment. He works on developing technology that improves the sustainability of modern society. This includes separation and treatment processes for compromised waters such as oil and water, improved sanitation systems, as well as technology for the identification, sorting, and reuse of products at their end of life (recycling and remanufacturing)

Giles Brereton, Associate Professor, Mechanical Engineering.

Prof. Brereton's research interests are in fluid-thermal sciences, with particular application to complex, multicomponent, unsteady flows in engines and in blood vessels. Recent examples of his research activities include developing: analytical and computational solutions to describe the evaporation of biofuel droplets sprayed into engines; new solutions for the transient flow in the arterioles and capillaries; and new solutions for the thermophoretic transport of soot in engine exhaust systems. Brereton is a life member of the American Physical Society and a member of the American Association for the Advancement of Science.

Tamara Reid Bush, Associate Professor, Mechanical Engineering

Prof. Bush's research interests are Biomedical, mechanics of seating, hand function, musculoskeletal dysfunction, pressure ulcers, and soft tissue responses to loading.

Changyong Cao, Assistant Professor, Mechanical Engineering

His current research interests are primarily in the areas of soft materials, nanomaterials and emerging electronics as well as additive manufacturing, including the mechanics and applications of soft materials and nanomaterials, the design, analysis and manufacturing of printable/flexible/stretchable electronics and medical devices, and the design and optimization of advanced materials.

Haseung Chung, Assistant Professor, Mechanical Engineering

Chung's research focuses on advanced manufacturing including additive manufacturing and dissimilar material joining, laser material processing, heat and mass transfer phenomena, thermal deformation modeling.

Gary L. Cloud, P.E., University Distinguished Professor, Mechanical Engineering

Prof. Cloud's research interests are experimental mechanics; optical techniques in strain measurement; fracture; fasteners; mechanics of composite materials.

Alejandro Diaz, Professor, Mechanical Engineering

Prof. Diaz's research interest focus on optimization theory and applications in mechanical and structural design, with special interest in methods for shape and topology optimization, design with advanced materials, and inverse problems in material design. Some of his current projects involve topology optimization problems in electromagnetics; design of membranes and multifunctional porous materials; applications of non-linear phenomena in sensor design, vibration isolation, and energy harvesting; and control of tension-aligned structures.

Abraham Engeda, Professor, Mechanical Engineering

Professor Engeda's research interests are experimental Thermo-fluids, Turbomachinery Flow Analysis and Design, Design and Testing of Centrifugal and Regenerative Flow Compressors and Pumps, Gas Turbine Combustion, Biogas for Power Generation.

Brian Feeny, Professor, Mechanical Engineering

Brian Feeny's research interests are in dynamics and vibration, with current activities in nonlinear dynamics, chaos, proper orthogonal decomposition, friction dynamics, waves, and system identification. Some current applications include windmill blade dynamics, vibrations of sports equipment and power tools, vibration absorbers, and bio-locomotion.

John Foss, Professor Emeritus, Mechanical Engineering

Research interests are analytical experimentation (determination of governing phenomena using flow field measurements), general fluid mechanics, turbulent shear flows, vorticity measurements, and automotive applications.

Rao Ganni, Adjunct Professor, Mechanical Engineering / FRIB/NSCL

Professor Ganni's research activities have been focused on advancement of thermodynamic principles and theories applied to cryogenic cycles, cryogenic systems and the related component development. Most of the research topics have been in the applied sciences related to cryogenic systems and they include thermodynamic exergy studies, heat exchangers, turbo machinery, screw compressors, sub-atmospheric pumping systems, control theories and instrumentation for these systems.

Tong (Tony) Gao, Assistant Professor, Mechanical Engineering

Dr. Gao's research covers a diverse array of problems in fluid mechanics and biophysics, with particular focus on active/soft matter, fluid-structure interactions, and multiphase flows. He is also

interested in developing and integrating numerical methods to resolve multiscale physics in complex fluids.

Yang Guo, Assistant Professor, Mechanical Engineering

Yang Guo's research interests are in manufacturing, materials processing, experimental mechanics, process control and optimization. Current research activities are (1) in-situ full-field measurement of chip plastic flow in machining using high-speed imaging and digital image correlation technique, (2) novel machining processes including modulation assisted machining and constrained machining, and (3) force-based adaptive control and optimization of machining processes.

Alan Haddow, Associate Professor Emeritus, Mechanical Engineering

Roger Haut, University Distinguished Professor Emeritus, Mechanical Engineering

Haut's research interests are impact-trauma biomechanics, orthopaedic biomechanics, and experimental mechanics.

Farhad Jaber, Professor, Mechanical Engineering

Professor Jaber's research interests are thermal-fluid science and engineering, turbulence, mixing and reaction, large scale and high performance computations, statistical modeling, multiphase transport, propulsion, micro-scale transport and combustion.

Firas Khasawneh, Assistant Professor, Mechanical Engineering

Professor Khasawneh's research interests are Nonlinear dynamics and vibration delayed, piece-wise continuous, periodic systems, and modeling of machining dynamics (e.g. turning and milling)

James Klausner, Professor, Chair of Mechanical Engineering

James Klausner's research interests focus on thermal, chemical, and fluid transport in a variety of applications including, energy, processing, thermal management, desalination, powder flow, cryogenics, and bioengineering. He has done extensive fundamental work on the dynamics of phase change phenomena, including nucleation and bubble dynamics. He is very interested in sustainable engineering processes and is currently working on using sunlight, water, recycled CO₂, and biomass as possible inputs to thermochemical reactors for synthetic fuel production, such as hydrogen and higher order hydrocarbons as the output. Highly concentrated solar radiation is used to drive high temperature thermo-chemical conversion processes. He is also working on using low grade waste heat and un-concentrated solar energy for low temperature desalination. He has developed a number of phase-change thermal management processes that operate at unprecedented heat fluxes. He has a strong interest in light metals processing and energy efficient advanced manufacturing. He has nine patents and copyrights that resulted from his research work.

Patrick Kwon, Associate Chair for Graduate Studies, Professor, Mechanical Engineering

Professor Kwon's research interests are material issues in design and manufacturing; manufacturing processes; mechanical behavior of materials; microstructured and graded materials.

Lik Chuan Lee, Assistant Professor, Mechanical Engineering

Lee's research interests are Continuum mechanics, computational mechanics, finite element method. My research focus is on computational cardiovascular mechanics with an emphasis on cardiac remodeling and electro-mechanics.

Zhaojian Li, Assistant Professor, Mechanical Engineering

His research interests are in intelligent systems, connected and autonomous vehicles, and learning-based control and estimation.

Peter Lillehoj, Assistant Professor, Mechanical Engineering

Prof. Lillehoj's research interests include BioMEMS, microfluidics, biosensors, and point-of-care diagnostics. Specifically, his work focuses on the development of microsystems for current and emerging applications in disease diagnosis, health monitoring, biosecurity and food/water safety. He also has interests in the development of simple and low-cost technologies for sample preparation & bioprocessing, and innovative approaches to manufacture disposable biosensors for global healthcare diagnostics.

Dahsin Liu, Professor, Mechanical Engineering

Prof. Liu's research interests are in mechanics of composite materials. His recent collaborative scholarly work includes research and development of: (1) peridynamic programming for simulating composite damage process under high-velocity loading; (2) quasi-three-dimensional woven composites and their manufacturing techniques; and (3) laboratory blast simulator, instrumented projectile, modified slip Hopkinson's bar, etc. He is a Fellow of the American Society for Composites and has received ASC/DEStech Award, SEM Harting Award and COE Withrow Teaching Award.

John Lloyd, Professor Emeritus, Mechanical Engineering

Prof. Lloyd's research interests are Use of Controllable Fluids for Heat Transfer, Fluid and Vibration Control, Turbomachinery Heat Transfer, Soldering Technologies.

Alfred C. Loos, Professor, Mechanical Engineering

Prof. Loos' research interests are Heat transfer and flow phenomena in materials processing; mathematical modeling of manufacturing processes; mechanics of materials; finite element analysis; polymeric composite manufacturing; mechanics of composite materials.

John McGrath, Professor Emeritus, Mechanical Engineering

Ricardo Mejia-Alvarez, Assistant Professor, Mechanical Engineering

I have worked extensively in experimental research of turbulent flows, hydrodynamic instabilities, and compressible flows. In particular, I have explored the fundamental science behind topics relevant to energy systems, aeronautic and hydrodynamic vehicles, geophysical flows, inertial confinement fusion, and astrophysics. Currently, I am developing research programs in the fields of turbulent mixing in binary flows with large viscosity ratios, Rayleigh-Taylor instabilities driven by surface and/or volumetric energy deposition, and blast-induced traumatic brain injury.

Norbert Mueller, Associate Professor, Mechanical Engineering

Turbomachinery, centrifugal compressors, wave rotors, refrigeration and HVAC (Heating, Ventilation, Air Conditioning) with natural refrigerants, micro-fabricated energy systems such as Brayton and Rankine cycle devices, heat exchangers and fuel cells with integrated nano sensors, highly efficient and environmentally friendly energy conversion systems, including the use of solar, wind, tidal, geothermal energy and clean fuels, high-speed drives and bearings, mechatronics.

Ranjan Mukherjee, Professor, Mechanical Engineering

Ranjan Mukherjee's research interests are in the broad area of mechatronics and robotics. He is a Fellow of the ASME.

Ahmed Naguib, Professor, Mechanical Engineering

Current research interests are in the areas of experimental fluid dynamics, particularly in the field of turbulence and transition physics and control, development of innovative sensors for wall-pressure and wall-shear-stress measurements using conventional and MEMS technology, and applications of innovative digital signal processing to the analysis of databases of flows.

Thomas Pence, Professor, Mechanical Engineering

Research Focus: Analytical and computational modeling, highly deformable solids (rubbers, polymers, gels, tissues, biotissue, and complex soft media), failure of composites, shape memory stents.

Merle Potter, Professor – Emeritus, Mechanical Engineering

Clark Radcliffe, Professor Emeritus, Mechanical Engineering

Clark Radcliffe's research expertise is in design of dynamic systems, modeling, and control of mechatronic systems, numerical and experimental methods for dynamic model validation, software for optimal vibration isolation system design, acoustic response measurement, acoustic modeling and active control, Statistical Energy Analysis (SEA) of automotive structures, active control of continuous structures, controllable fluids such as electrorheological fluids, and magnetorheological fluids internet-based, distributed, engineering design.

Rajiv Ranganathan, Assistant Professor, Mechanical Engineering

Prof. Ranganathan's research interests are biomechanics of human movement, motor learning and control, rehabilitation robotics.

William Resh, Professor, Mechanical Engineering

His research interests include dynamic systems, noise and vibration, engines and propulsion systems, and integrated systems design and development.

Sara Roccabianca, Assistant Professor, Mechanical Engineering

Continuum mechanics applied to biomaterials, in particular I am interested in skin mechanics and skin growth and remodeling (i.e. pregnancy, skin expansion for surgical repair, aging). Non-linear solid mechanics, specifically my research focus on bifurcation theory and material instability.

Ronald Rosenberg, Associate Dean Emeritus, Mechanical Engineering

Rosenberg's research interests are intelligent online tutor system for MATLAB review, and the flipped classroom: impact of digital technology on learning in engineering.

Himanshu Sahasrabudhe, Assistant professor, Mechanical Engineering

His current research area includes innovations in materials systems, structures, and process development using Laser-DED and Hybrid Manufacturing, with applications in aerospace, biomedical, heavy machinery and energy industry.

Harold Schock, Professor, Director Energy and Automotive Research Labs, Mechanical Engineering

His current research thermodynamics, combustion, optical diagnostics, turbulence, internal combustion engines.

Daniel Segalman, Professor, Mechanical Engineering

Dan Segalman earned his PhD in Engineering Mechanics from the University of Wisconsin in 1978. He then worked in research laboratories of the automobile and petroleum industries. In 1986 he joined Sandia National Laboratories in Albuquerque NM. There he worked in a variety of topics, including geomechanics, mechanics of materials, smart materials and structures, vibrations, dynamics, and uncertainty quantification. Dr. Segalman retired from Sandia in March of 2014 as a Distinguished Member of Technical Staff and joined the Department of Engineering Physics of the University of Wisconsin as a Senior Scientist. In March of this year, he joined the Mechanical Engineering Department of the Michigan State University.

Steve Shaw, University Distinguished Professor, Mechanical Engineering

General expertise: engineering applications of dynamical systems. Past interests include vibro-impact systems, rotor dynamics, and nonlinear modal analysis. Current interests: (i) micro- and nano-scale resonators with sensing and signal processing applications, with a special emphasis on understanding and exploiting nonlinear and noisy behavior; (ii) nonlinear vibration absorbers, with particular focus on applications for automotive engines. Steve currently serves in editorial capacities for the SIAM Journal on Applied Dynamical Systems, Nonlinear Dynamics, and the ASME Journal of Vibration and Acoustics. He is a Fellow of the ASME, recipient of the SAE Arch T. Colwell Merit Award, the Henry Ford Customer Satisfaction Award, the ASME Henry Hess Award, and the MSU Distinguished Faculty Award.

Rodney Tabaczynski, Professor, Mechanical Engineering

Dr. Tabaczynski's research interests are focused on the transient behavior of combustion during the cold start of an engine system. This initial period of engine operation is critical for meeting the emission standards for ultra-low emission vehicles. In addition, he is interested in the fundamental structure of turbulent flows. He is a fellow in the Society of Automotive Engineers and a member of the National Academy of Engineering.

Brian S. Thompson, Professor, Mechanical Engineering

Professor Thompson's research interests are international humanitarian engineering, high speed machinery, composite materials, smart materials, design methodologies.

Elisa Toulson, Assistant Professor, Mechanical Engineering.

Dr. Toulson's research interest are in combustion, ignition, alternative fuels, thermodynamics and internal combustion engines.

Chang Wang, Adjunct Professor Mechanical Engineering/Professor Mathematics

Professor Wang's research interests are laminar fluid mechanics, heat conduction and convection, vibration and stability of membranes, beams and plates, physiological modeling.

Indrek Wichman, Professor, Mechanical Engineering

Professor Wichman's research interests are combustion and flame studies related to fire and theoretical combustion, analytical modeling (fire, ignition, quenching, flame spread, instabilities), computational modeling (flame spread, triple flames, instabilities, solid pyrolysis, microgravity flames), experimentation (MSU fire tunnel, thermal property measurement, flames in small enclosed spaces (micro flames), burner flame attachment).

Adam Willis, Adjunct Professor Mechanical Engineering

Neil T. Wright, Associate Professor, Mechanical Engineering
Prof. Wright focuses on heat transfer; thermophysical property measurement; parameter estimation; thermal biology.

Xinran (Sharon) Xiao, Professor, Mechanical Engineering.
Prof. Xiao's research interests are in Mechanical behavior of metal, polymer, composite materials, fracture, fatigue, crashworthiness, multiphysics phenomena.GM, and American Chemistry Council (ACC) support her work.

Junghoon Yeom, Assistant Professor, Mechanical Engineering.
Yeom's research interests are in nanomanufacturing, nanomaterials, and microfabrication. Applications to miniaturized gas sensing systems, MEMS, separation, catalysis, and micro power generation.

Junlin Yuan, Assistant Professor, Mechanical Engineering
Junlin Yuan's research interests include turbulence simulations and modeling, transition and separation control, and fluid-structure interaction. Flow physics interpreted from large-scale simulations are used to develop and improve turbulence models in realistic scenarios in engineering, environmental and biological flows.

Mohsen Zayernouri, Assistant Professor, Mechanical Engineering
Mohsen Zayernouri is the director of the Fractional Mathematics for Anomalous Transport and Hydromechanics (FMATH) group. The overarching theme of research in FMATH is to bring to bear advanced computational tools from applied mathematics and data sciences to develop multi-fidelity and predictive simulation tools for challenging engineering problems, including: stochastic Lévy processes in turbulent flows, shock and interface problems in reacting and multi-phase flows, anomalous transport in porous and disordered materials, sub-/super-diffusion processes in the human brain, and complex bio-materials and tissue engineering.

Guoming (George) Zhu, Professor, Mechanical Engineering & Electrical and Computer Engineering
Prof. Zhu's research interests are closed loop combustion control, automotive system ID and control, optimal control of hybrid powertrain systems, powertrain system modeling and HIL simulation, combustion sensing, control of TEG (thermo-electric generator), application of the smart material to automotive systems.

Dean of Engineering's Office (Faculty not associated with a primary department)

Manoochehr Koochesfahani, Professor & Associate Dean for Grad Studies & Faculty Dev
Prof. Koochesfahani research interests are turbulent shear flows and turbulent mixing, unsteady fluid mechanics and aerodynamics, optical diagnostics techniques, molecular tagging diagnostics, Quantum Dot (QD) imaging of fluid flow.