The College of Engineering Proudly Welcomes
17 NEW FACULTY
It is my great pleasure to welcome 17 talented new faculty to the College of Engineering. In conjunction with the University’s Path to Prominence, the College of Engineering has developed an ambitious strategic plan of its own. The plan calls for doubling our size by 2020. In 2009, the college had 97 faculty members. With these new hires, and the addition of the Department of Computer and Information Sciences and the Center for Energy and Environmental Policy, the college has already grown to 113 faculty and increased the percentage of women faculty from 13 to 17%. Continued growth will be fueled by ongoing cluster searches in areas related to sustainability (energy and the environment), health care, national security, computer and information technology, and advanced materials.

Michael Chajes
Dean, College of Engineering
University of Delaware

**WILFRED CHEN**
Gore Professor of Chemical Engineering
Chemical Engineering
Ph.D. ’93
California Institute of Technology

Wilfred’s research addresses global challenges resulting from the complex interactions between humans and the rest of the biosphere. These include energy sustainability, severe pollutions and emergence or re-emergence of old and new epidemics and diseases. In particular, Wilfred’s interests include cellular and metabolic engineering, synthetic biology for biofuel production, protein therapeutics, viral detection, drug discovery, and protein purification.

**JAMES CLAUSE**
Assistant Professor
Computer & Information Sciences
Ph.D. Pending
Georgia Institute of Technology

To help programmers automatically correct bugs and write less error-prone applications, James’ research focuses on software engineering with a concentration on debugging and program analysis design. His most recent work includes developing techniques to automatically capture, anonymize and alert developers of user performed actions that trigger complications on end user computers.
Michael Klein
Dan Rich Chair of Energy
Director
UD Energy Institute
Professor
Chemical Engineering
Ph.D. ’81
Massachusetts Institute of Technology

Feng's primary research focus is on the design and synthesis of nanostructured materials to meet the need for future energy solutions. Using catalysis, materials science and electrochemistry, he is able to address the exciting scientific challenges that occur in the field of energy conversion and storage. Breakthroughs in this field are crucial in order to tackle global warming by providing the society with clean, sustainable and environmental friendly energy supplies, and zero CO2 emission electric vehicles.

Juejun Hu
Assistant Professor
Materials Science & Engineering
Ph.D. ’09
Massachusetts Institute of Technology

Juejun’s research focuses on exploring photon-matter interactions in the nano-scale for sensing and energy conversion applications. His work has led to the creation of highly sensitive chem-bio sensors-on-a-chip, energy-efficient light emitting diodes for solid state lighting, as well as thin film solar cells with significantly improved energy conversion efficiencies.

David Colby
Assistant Professor
Chemical Engineering
Ph.D. ’05
Massachusetts Institute of Technology

David uses cellular and molecular engineering approaches to study diseases of the nervous system. Among his interests are the many aspects of engineering cells and proteins for biomedical applications focused on protein misfolding diseases, such as those caused by prions (infectious proteins). He is developing biophysical tools and mathematical models to dissect disease mechanisms and identify therapeutic targets.

Feng Jiao
Assistant Professor
Chemical Engineering
Ph.D. ’07
University of St Andrews, UK

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Michael is devoted to the construction of molecule-based kinetic models for complex chemistries. His research has produced a set of software tools for model development that includes probabilistic techniques for the construction of the feed molecular composition; methods for the deduction and organization of reaction paths and kinetics; graph theoretic methods for the construction of model equations; and a user-friendly environment for the solution of this chemical reaction network for prediction at both the molecular and global levels.
Julia's area of expertise is environmental microbiology. Her research examines microbial responses to environmental inputs using high-throughput sequencing, bacterial genetics and physiology in order to understand the basic processes necessary to control the microbes. Specifically, she is studying the effects of chemical amendments on carbon fixation rates and gene expression in a ferruginous tropical lake, and characterizing microbial signaling in coastal and hot spring biofilms.

Xin is investigating the mechanochemical conversation at both molecular and cellular levels using microscopy techniques, nanotechnology and computer modeling. He hopes his efforts will uncover new therapeutic interventions to mitigate or treat these diseases. His research focuses on the mechanobiology in musculoskeletal system, specifically how cartilage and bone cells sense the mechanical forces generated during physical activity and transfer these signals into orchestrated cellular activity.

Christopher’s primary research focus is on stimuli-responsive materials, which include light-actuated, environmentally adaptable, and self-healing materials, for applications ranging from low stress and healable dental restoratives to photo-induced delivery of gene therapeutics. He uses an array of synthetic approaches, from basic organic synthetic reactions to controlled polymerization, to fabricate these novel materials. The chemical and mechanical properties are then characterized to better understand how the basic chemical constituents result in the observed macroscopic property.

April is developing materials with highly controlled properties for spatiotemporal regulation of the cell niche and utilizing biological techniques to characterize and exploit these materials for cell culture and tissue regeneration. With her research, she aims to control material properties on multiple time and size scales to probe and direct cell function.

To understand the etiology of osteoarthritis and osteoporosis, Xin is investigating the mechanochemical conversation at both molecular and cellular levels using microscopy techniques, nanotechnology and computer modeling. He hopes his efforts will uncover new therapeutic interventions to mitigate or treat these diseases. His research focuses on the mechanobiology in musculoskeletal system, specifically how cartilage and bone cells sense the mechanical forces generated during physical activity and transfer these signals into orchestrated cellular activity.

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To meet the need for complex, dynamic cell culture environments, April is developing materials with highly controlled properties for spatiotemporal regulation of the cell niche and utilizing biological techniques to characterize and exploit these materials for cell culture and tissue regeneration. With her research, she aims to control material properties on multiple time and size scales to probe and direct cell function.

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IOANNIS POULAKAKIS
Assistant Professor Mechanical Engineering
Ph.D. ’08
University of Michigan

Thomson’s current research interests are in the application of nonlinear control theory in biologically-inspired legged robots. On a macroscopic level, locomotion on land can be understood through archetypal reductive models capable of capturing the targeted behavior, e.g. running. The coordinated recruitment of the robot plant into such “target” models constitutes the central problem addressed in this work, which aims at offering a mathematically precise feedback control methodology for synthesizing controllers for legged robots.

HAGIT SHATKAY
Associate Professor Computer & Information Sciences
Ph.D. ’99
Brown University

Hagit works in the area of computational biomechanics to more fully understand, predict, and ultimately prevent disease. She works in close collaboration with biologists and physicians to model biological processes, disease and treatment, using abundant, diverse biological and medical data.

THOMAS SCHUMACHER
Assistant Professor Civil & Environmental Engineering
Ph.D. ’10
Oregon State University

Thomas’ main research is involves infrastructure monitoring and maintenance. Worldwide, structures are aging and many have reached their intended service-life limit. However, replacements are costly and often not feasible. Thomas is developing monitoring and evaluation systems that use non-destructive testing methods to extend the life and increase the safety of existing structures. His other interests include the behavior of structures under dynamic multi-hazard loadings, innovative composite bridges, and quantification of uncertainty in engineering.

KARL STEINER
Senior Associate Provost for Research Development
Professor Electrical & Computer Engineering
Ph.D. ’95
University of Kaiserslautern

Image enhancement and visualization methodologies are the predominant focus of Steiner’s research. His current research interests centers on interactive immersive visualization methodologies for the life sciences, primarily in complex multi-variant data analysis and in biomedical imaging with a focus on virtual surgery simulations. His early research focused on non-destructive evaluation and image analysis of engineered structures, such as aircraft wings, automotive panels, bridge structures, and hip implants.
Jonghwan’s research interests include energy absorbing composites, lightweight multifunctional composites, structural health monitoring and bio-inspired material systems. An advocate of interdisciplinary research, his work focuses on composite materials, mechanical engineering, aerospace structures and bio-mimetics that impact structural applications to stimulate scientific discovery, support novel material development, advance future aerospace technologies, facilitate technology transfer and enhance student learning.

Kristina’s primary research centers on software engineering, with a focus on requirements engineering. The overall goal of her research is to increase stakeholder participation in early software engineering activities and thereby improve the quality of the final product. Kristina’s interests also include exploring ways to leverage software requirements in other software engineering activities such as design and testing.

In the face of the increasing levels of execution uncertainty in future computer systems, Chengmo’s work focuses on defining a reliable multicore architecture with fine-grained, yet predictable, adaptivity support to advance semiconductor technology. Among her interests are execution adaptivity and reliability enhancement in multicore systems, power- and thermal-aware system design, efficient on-chip communication and synchronization schemes, as well as compiler-directed optimizations of embedded processors.

To the extent permitted by applicable State and Federal laws, the University of Delaware is committed to assuring equal opportunity to all persons and does not discriminate on the basis of race, creed, color, sex, age, religion, national origin, veteran or handicapped status, or gender identity and expression, or sexual orientation in its educational programs, activities, admissions, or employment practices as required by Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, Title VII of the Civil Rights Act of 1964, and other applicable statutes. The University of Delaware has designated Karen Mancini, Director of the Office of Disabilities Support Services, as its ADA/Section 504 Coordinator under Federal law. Inquiries concerning Americans with Disabilities Act compliance, Section 504 compliance, campus accessibility, and related issues should be referred to Karen Mancini (302-831-4643) in the Office of Disabilities Support Services. Inquiries concerning Title VI and Title IX compliance and related issues should be referred to the Director of the Office of Equity and Inclusion, Becky Fogerty (302-831-8063). [COE_NewFacultyMailer_1010]