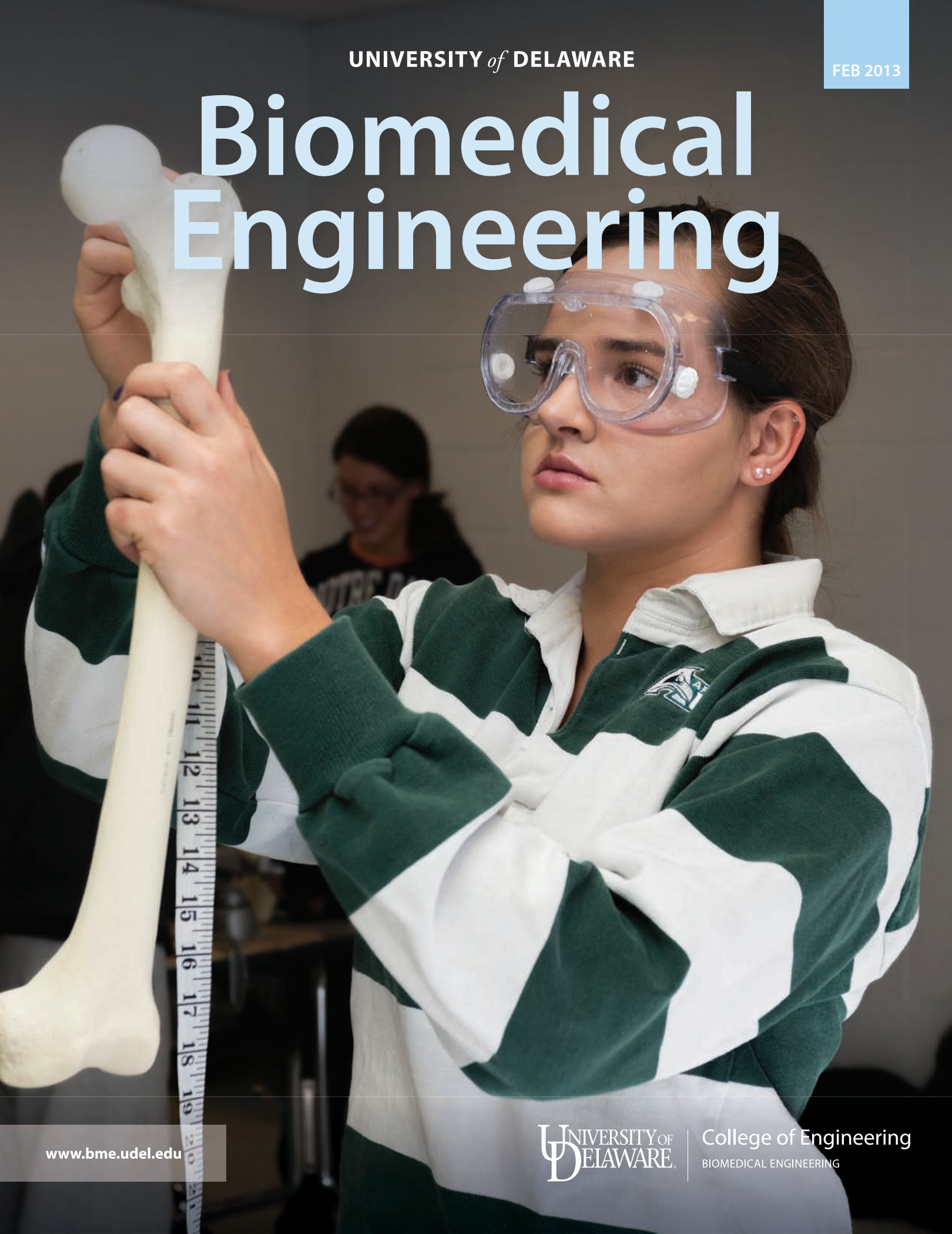
UNIVERSITY *of* DELAWARE

FEB 2013

Biomedical Engineering



www.bme.udel.edu

UNIVERSITY OF DELAWARE | College of Engineering
BIOMEDICAL ENGINEERING

Mission Statement

To deliver a high quality of education in applying quantitative engineering analysis and design to biology and medicine.

To conduct high impact research at the engineering-biology interface that reveals basic knowledge of disease mechanisms to improve human health, and that develops new technologies and therapies to improve the quality of life.

DAWN ELLIOTT

Dear Friends and Colleagues,

This has been a wonderful year for Biomedical Engineering at the University of Delaware! Our affiliated faculty is 54 strong with 18 holding primary or joint appointments with research spanning many areas:

- Biodevices, biocomputing and bioimaging
- Biomechanics
- Biomolecular engineering, cellular engineering and systems biology
- Neuroengineering and rehabilitation engineering
- Tissue engineering, biomaterials and drug delivery

Many faculty were awarded honors (see p.13) and won grants (see p.14), and our program is growing rapidly. We are actively searching for tenured and tenure-track faculty who will start in Fall 2013, and we plan to continue hiring for several years.

Now in its third year, our undergraduate program is highly popular, with each class capped at 50 students. Our undergrads are flourishing, and last year, three of them won awards (see p. 7). Many participated in summer research projects and presented their work at UD's Undergraduate Research and Service Celebratory Symposium, with one BME undergrad taking third place (see p. 6). In addition, our Biomedical Engineering Society student chapter is now approved and is planning many new programs for the upcoming year (see p. 7). We are very proud of these smart, energetic and socially dedicated young men and women.

We began our graduate program this fall with seven outstanding doctoral students, one a Gore Fellowship awardee (see p. 5). Next year, we look forward to expanding our program to include a master's degree.

We ended last year with the first BME symposium where 29 faculty affiliated with the program presented their research in an array of biomedical fields (see p. 4). More than 110 students and faculty attended and made important connections. In a retreat the following day, primary and joint faculty set forth a plan for strengthening and broadening our BME program.

Given this year's resounding success, we are excited for the next year to unfold.

Warm regards,

Dawn Elliott
Professor and Director
Biomedical Engineering

Biomedical Engineering Faculty

BIODEVICES, BIOCOMPUTING AND BIOIMAGING include biomedical instrumentation and sensors, applications of nanotechnology to biomedicine, human-computer interaction systems, modeling and analysis of biomedical data, biomedical text mining, biomedical signal and image processing, and medical imaging modalities (including CT, MRI and ultrasound).

BIOMECHANICS applies experimental and computational approaches to explore biomechanical function across multiple scales, including the molecule, cell, tissue and system.

BIOMOLECULAR ENGINEERING, CELLULAR ENGINEERING AND SYSTEMS BIOLOGY study, model and modify biomolecules, cells and the regulatory networks that control genetic, biochemical, cellular and physiological functions.

NEUROENGINEERING AND REHABILITATION ENGINEERING explore the neural control of posture and movement, brain-machine and other neural interfaces, biomimetics, motor learning and robotic training for rehabilitation, decision-making and artificial intelligence, and neuromuscular system modeling.

TISSUE ENGINEERING, BIOMATERIALS AND DRUG DELIVERY examine the application of biologically inspired and biologically produced materials for the delivery of therapeutic molecules, the understanding of cell biology and mechanotransduction, the repair of damaged tissues and the creation of functional substitutes.

ADJ = Adjunct; BIOL = Biology; BME = Biomedical Engineering; CBE = Chemical & Biomolecular Engineering; CIS = Computer & Information Sciences; ECE = Electrical & Computer Engineering; KAAP = Kinesiology & Applied Physiology; ME = Mechanical Engineering; MLS = Medical Laboratory Sciences; MSE = Materials Science & Engineering; PT = Physical Therapy

		Biodevices, Biocomputing and Bioimaging	Biomechanics	Biomolecular Engineering, Cellular Engineering & Systems Biology	Neuro-engineering & Rehabilitation Engineering	Tissue Engineering, Biomaterials & Drug Delivery
PRIMARY/JOINT FACULTY						
Arce, Gonzalo	ECE	•				
Barner, Kenneth	ECE	•			•	
Buchanan, Thomas	ME	•	•		•	
Chen, Wilfred	CBE			•		
Duncan, Randall	BIOL			•		•
Elliott, Dawn	BME	•	•			
Higginson, Jill	ME	•	•		•	
Jia, Xinqiao	MSE		•			•
Kiick, Kristi	MSE			•		•
Lee, Kelvin	CBE			•		
Lenhoff, Abraham	CBE		•	•		
Martin, David	MSE	•			•	•
Mirotznik, Mark	ECE	•				
Papoutsakis, Eleftherios	CBE			•		•
Shatkay, Hagit	CIS	•				
Singh, Abhyudai	ECE	•		•		
Taufer, Michela	CIS	•				
Wang, Liyun	ME	•	•	•		•
AFFILIATED/ADJUNCT FACULTY						
Advani, Suresh	ME		•			
Akins, Robert	ADJ					•
Beris, Antony	CBE	•				
Binder-MacLeod, Stuart	PT				•	
Braun, Richard	MATH		•	•		
Buckley, Jennifer	ME		•			
Burris, David	ME		•			•
Colby, David	CBE			•		
Epps, Thomas	CBE					•
Fok, Pak-Wing	MATH	•		•		
Galloway, Cole	PT	•	•		•	
Kambhamettu, Chandra	CIS	•				
Kirn-Safran, Catherine	BIOL			•		•
Kloxin, April	CBE					•
Kumar, Arun	MLS			•		•
Lee, Samuel	PT				•	
Liao, Li	CIS			•		
Lu, Xin (Lucas)	ME		•	•		•
Manal, Kurt	ME		•		•	
Nohe, Anja	BIOL	•		•		
Ogunnaike, Babatunde	CBE			•		
Pochan, Darrin	MSE					•
Poulakakis, Ioannis	ME		•		•	
Price, Christopher	ME		•			
Rabolt, John	MSE					•
Roberts, Christopher	CBE			•		•
Santare, Michael	ME		•			
Singh, Anita	BME					
Snyder-Mackler, Lynn	PT		•			
Stanhope, Steven	KAAP		•		•	
Steiner, Karl	ECE	•				
Sullivan, Millicent	CBE			•		•
Tanner, Herbert	ME			•	•	
Wu, Cathy	CIS			•		
Yu, Jingyi	CIS	•				
Zurakowski, Ryan	ECE			•		

Focus on collaboration

Biomedical engineering's inaugural symposium, held May 22, was an exciting opportunity to showcase for students and faculty how this dynamic field is evolving.

"Biomedical engineering is a significant part of the University's Path to Prominence," noted **BABATUNDE OGUNNAIKE**, William L. Friend Chair of Chemical Engineering and interim dean of engineering. "Under **DAWN ELLIOTT**'s leadership, this symposium heralds the next phase in the program's evolution—crystallizing and consolidating all the disparate bioengineering efforts across campus, and acting as a catalyst for cross-departmental and cross-college collaborations."

Twenty-nine faculty affiliated with the program showcased their research and collaborations in an array of biomedical fields, including biomedical computing, bioelectronics, biomolecular engineering, cellular engineering, biomechanics and neuroengineering.

Although the program is new, Elliott was quick to remind attendees that there is already a strong biomedical engineering research presence in place at UD. "Building on the strong existing foundation, we are creating new collaborations, reaching out to clinical partners and designing the future educational and research programs that will help shape this growing field at UD, in Delaware and around the world," she said.

UD's undergraduate BME program, now in its third year, has developed a strong foothold on campus, and remains hugely popular with students.

This fall, 50 freshman undergraduates joined 110 rising sophomore and juniors already in the program. Of all BME students, 31% are honors students and about half are Delawareans.

The BME program also welcomed seven outstanding graduate students this fall to its new doctoral program, approved by the University's Faculty Senate in February.

"We are particularly excited that our program includes more than 40 percent female representation—diversity not often achieved in engineering," Elliott noted.

Following the symposium, faculty members participated in a day-long retreat to align their vision and goals for broadening and strengthening the program.

Building our future

Attracting high quality graduate students and preparing undergraduates to enter the workforce are top priorities for the College of Engineering. As the biomedical engineering program continues to emerge as a dynamic specialty within the college, we are grateful for the alumni and friends who generously support the growing needs of our students and faculty.

A $1 million gift from UD alumnus and trustee emeritus **ROBERT W. GORE CHE59** creates two College of Engineering graduate fellowships for incoming doctoral students with strong academic progress. The annual fellowships are awarded at the dean's discretion to help first-year graduate students support educational and living expenses.

ASHUTOSH PARAJULI, one of the first seven doctoral students to enter the biomedical engineering graduate program introduced this fall, is the first Gore Fellowship recipient. Originally from Nepal, Parajuli received his bachelor's degree in mechanical engineering from Brigham Young University in Utah.

Dr. Gore served as president of W.L. Gore and Associates, Inc. (Newark, Del.), world-renowned for its fluoropolymer products, most notably GORE-TEX® fabrics.

Another noteworthy gift this year is the *Matthew Maguire Celebration of Life Memorial Awards*, established by Michele Schwander, academic advisor for BME, in memory of her brother.

The family created these awards to help fund summer research for two deserving undergraduate BME students (see p. 7).

You, too, can make a significant impact by supporting biomedical engineering. Whether an annual gift to support undergraduate and graduate student needs such as scholarships, stipends, senior design projects and lab improvements, or a term or endowed gift of a faculty position, your support will have a tremendous impact on our program.

To learn how you can help advance the biomedical engineering program, contact **ARMAND BATTISTI**, director of development, at 302-831-7273 or aab@udel.edu.

Advisory Council

Distinguished alumni and friends representing a cross-section of biomedical engineering talents have formed an Advisory Council to lend their expertise and provide valuable guidance to our BME program leaders. Welcome and thank you to our inaugural members:

BRUCE C. ROBERTSON ChEPhD89 (chair)
UD Research Foundation board member
Managing director, H.I.G. Bioventures

MICHAEL J. AXE, M.D.
Adjunct professor, Physical Therapy
Board-certified orthopaedic surgeon; partner, First State Orthopaedics

DR. JOHN V. FLYNN, JR. ChE64
Retired global partner, Deloitte Consulting

ELIZABETH M. (LIZ) GRIGGS CEHD84
Founder, chairman, CEO, NextImage Medical, Inc.

JOHN T. (JACK) KRAMER ChE82
UD Research Foundation board member
Global technology leader, W.L. Gore and Associates

DR. MICHELE S. MARCOLONGO ME86
Senior associate vice provost for translational research, Drexel University

HELEN STIMSON
Alfred Lerner College of Business and Economics Advisory Council, UD past parent
VP & general manager, consumables & supplies division, CAG, Agilent Technologies, Inc.

BME undergraduates gain hands-on engineering and orthopaedic experience

Some 30 high school women and early UD undergraduates from both biomedical and mechanical engineering spent a day in May repairing broken legs and torn knee ligaments, identifying and correcting scoliosis and suturing skin with the help of UD biomedical and mechanical engineering faculty and undergraduates. The hands-on experience was offered by the Perry Initiative, an outreach program dedicated to inspiring high school women to pursue careers in STEM fields (science, technology, engineering and mathematics).

BME sophomore **ANNIE SANGER** assisted with the program, while sophomore **STACY HAND**, and freshmen **UNNATI PATEL** and **EMILY PAVILONIS** were among the participants.

"The Perry Initiative really helped me figure out if orthopaedics was right for me," explained Patel. "It was inspiring to listen to speakers who were in the same position that I am now and who have become successful doing what they love."

Mechanical engineering assistant professor **JENNI BUCKLEY**, co-founder of the Perry Initiative, and associate professor **JILL HIGGINSON**, as well as professor **DAWN ELLIOTT**, were on hand to describe their fields of expertise to the women and share the academic paths that led them where they are today.

Summer research showcase

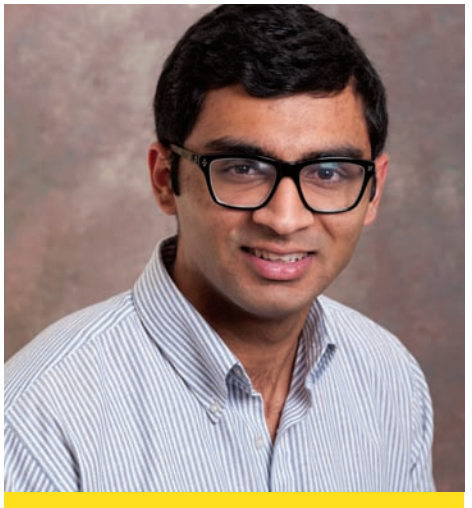
Eight undergraduates showcased their summer research at the third annual Undergraduate Research and Service Celebratory Symposium—**KEVIN CHANG**, **SAI GAJJALA**, **RYAN MITCHELL**, **JAYMIN MODI**, **ANNIE SANGER**, **AMANDA STOUT**, **ANNA SUNG** and **MOLLY WESSEL**.

Sanger, a junior, won a 3rd place sustainability prize for "Recycling of Bio-Rad SDS gel Cassettes." She worked in the lab of **CATHERINE GRIMES**, professor of chemistry and biochemistry, studying NOD2, a protein associated with innate immunity.

In her research, Sanger used SDS gels to check for proper protein expression and noticed that the cassettes that housed these gels were discarded in large quantities. As a side project, she investigated options for recycling these cassettes and worked out a method of re-using them. "On a whim, I decided to apply for the award, and was shocked and honored to accept third place," she said.

CAITLIN BANKS

SABRINA CASAS



JAYMIN MODI

Undergrads awarded research funding

Three undergraduate students were among those honored at the College of Engineering's Recognition of Academic Honors and Achievements Ceremony held May 12.

CAITLIN BANKS, a sophomore from Sterling, Va., received the Elbert C. Wisner Resources to Insure Successful Engineers (RISE) Corporate Friends Award, given to an undergraduate engineering student who demonstrates outstanding scholarship and promise for success. She plans to pursue a graduate degree in biomedical engineering and to conduct research in either biomechanics or medical devices, preferably with stroke patients.

SABRINA CASAS, a sophomore from Newark, Del., and **JAYMIN MODI**, a freshman from Hockessin, Del., each received Matthew Maguire Celebration of Life Memorial Awards to fund their summer research in UD labs. Casas conducted research with **DAVID COLBY**, assistant professor of chemical and biomolecular engineering, whose lab uses engineering strategies to develop novel therapies for diseases caused by protein misfolding. Modi worked with **DARRIN POCHAN**, professor of materials science and engineering, who develops new nanostructures and functional materials through the assembly of soft materials such as polymers and proteins.

BMES student chapter earns official status; adopts mobility project to help children

Previously registered as a student club, the Biomedical Engineering Society's student chapter earned official BMES and UD approval in August. Led by a five-member executive board of junior BME majors—**KEVIN CHANG**, **AUDREY GUYER, STACEY HAND, DEREK HUNTER** and **ANNIE SANGER**—the chapter plans to foster undergraduate interactions, to create a mentoring program to match freshmen with upperclassmen, and to investigate GREs, MCATs and graduate school programs, among other things.

The chapter kicked off its first year by setting up a hands-on engineering project with **COLE GALLOWAY**, a physical therapy professor who modifies off-the-shelf toy race cars to provide mobility for children who can't crawl or walk. Chapter members plan to meet weekly to develop a way to transform these cars into power walkers for children (see p. 10). The experience offers undergrads unprecedented exposure to solving real-world engineering problems, and will directly impact the quality of life for the children using these devices.

XINQIAO JIA's research focuses on developing intelligent biomaterials that closely mimic the molecular composition, biological function, mechanical responsiveness and nanoscale organization of the natural matrices surrounding cells.

XINQIAO JIA *(pictured, left)*, associate professor of materials science and engineering, is an expert in biomaterials and tissue engineering. Her research focuses on developing intelligent biomaterials that closely mimic the molecular composition, biological function, mechanical responsiveness and nanoscale organization of the natural matrices surrounding cells. Her research group is actively developing methodologies to engineer functional vocal folds, salivary glands and cartilage.

One of her collaborative efforts with Rice University (Houston) and Christiana Care Health System (Wilmington, Del.), involves breaking new ground in the creation of artificial salivary glands, hoping for new solutions for xerostomia (dry mouth), an inevitable consequence of radiation treatment for head and neck cancers. The Jia group is developing hydrogels that will be used as instructive matrices to guide the salivary cells through the morphogenesis process and to potentially organize them into functional salivary glands. The hydrogels can be "tuned" to match the structure and properties of the native tissues in salivary glands, increasing the potential for success. Collaborating with the Helen F. Graham Center's Center for Translational Cancer Research, her team hopes the work will translate into reliable methods to produce artificial salivary glands. Doctors will culture a patient's cells prior to radiation treatment and then re-implant the salivary glands grown from the patient's own cells back into his or her mouth following treatment.

RYAN ZURAKOWSKI, assistant professor of electrical and computer engineering, studies nonlinear control theory and applications, specifically in mathematical biology and medicine. He is investigating a treatment method to reduce the risk of treatment failure in HIV patients who have already experienced failure with their HIV treatment protocol. The Zurakowski group is developing model-based approaches to consider the contribution of viral load (or infection level) to the probability of failure.

Early results indicate that when a treatment fails, steps should be taken to reduce this viral load before a patient switches to a new regimen. This approach significantly lowers the chances of developing a resistance to the next treatment. For those who experience multiple failed therapies, Zurakowski has also found that constructing a temporary "mix and match" regimen from previously ineffective combinations may minimize the risk of additional treatment failures. Zurakowski's research could help clinicians design and customize optimal treatment plans for transitioning patients whose antiviral regimen to an alternate set of medications has failed.

COLE GALLOWAY is bringing mobility and sociability to kids with disabilities.

COLE GALLOWAY *(pictured, left)*, associate professor in physical therapy, is bringing mobility and sociability to kids with disabilities. He recently began adapting off-the-shelf toy race cars to provide mobility to children who can't crawl or walk, empowering them to be part of the action at home, in the daycare center or on the playground. His work improves the odds for kids whose mental, social and emotional development is delayed because of their physical inability to explore their environment.

The cars come from the toy store, but have some added features—roll bars made out of PVC pipe, sling seats made from soft fabric, harnesses fashioned from mesh and plastic, and specialized consoles over the steering wheel. Working with UD's Early Learning Center, Galloway and his team, including the newly chartered BMES student chapter (see p. 7), individually adapt each car to a specific child's needs. One of their larger goals for the project is to create a toolkit for others who want to adapt the cars for kids with special needs.

Galloway is also collaborating on high-tech robotic devices for disabled children.

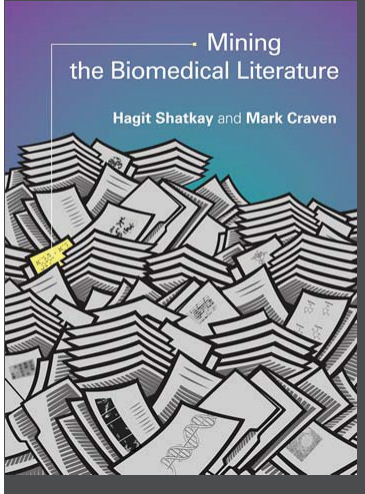
THOMAS BUCHANAN, George W. Laird Professor of Mechanical Engineering and director of the Delaware Rehabilitation Institute, and **KURT MANAL**, assistant professor in mechanical engineering, are conducting research directed at understanding muscle and joint forces in healthy individuals and patient populations.

The biomechanical models they have developed integrate human movement analysis and medical imaging (MRI & ultrasonography) to create patient-specific models of the ankle, knee and elbow joints. These models are driven by muscle activation patterns recorded from the patient and are therefore inherently sensitive to the way individuals activate their muscles. This is important, as no two people activate their muscles exactly the same way. Their research has examined muscle and joint compressive forces in patients following stroke, those with knee osteoarthritis (OA) and in patients before and after anterior cruciate ligament (ACL) reconstructive surgery. The group is working towards implementing their biomechanical models in real time to provide patients and clinicians with immediate feedback on the loading pattern.


BUCHANAN


MANAL

HAGIT SHATKAY, associate professor of computer and information sciences, develops computational methods for addressing data-intensive problems in biology and medicine. Her research lies at the intersection of machine learning, data-mining and biomedicine.



(*MIT Press*, 2012)

For the past decade she has been among the leading researchers in the area of biological text mining. She recently co-authored the first book on this subject, "Mining the Biomedical Literature," with Mark Craven, a professor at University of Wisconsin, Madison. Her current projects include developing computational tools that utilize data from diverse sources in order to gain a better understanding of protein location and function, and developing data-analysis methods that better identify certain medical conditions and diseases.

Leveraging mathematical techniques toward therapeutic drug design

ABHYUDAI SINGH, assistant professor of electrical and computer engineering, and an affiliated faculty member of the Center for Bioinformatics and Computational Biology, uses mathematical techniques utilized in studying engineering control systems to model and analyze the stochastic dynamics of gene-protein networks inside individual living cells. These mathematical models reveal how these networks encode feedback and how deregulation of this feedback leads to disease. The Singh group is also building methodologies to combine these computational techniques with high-throughput experimental data in order to reverse-engineer gene-protein networks, and to map novel regulatory mechanisms within them.

Singh is currently characterizing the gene networks underlying pathogenic viruses, such as HIV. A better functional understanding of these networks will enable their manipulation for therapeutic benefit. Thus, by systematically tweaking interactions and changing protein levels, one could guide drug design.

Singh received master's degrees in both mechanical and electrical and computer engineering from Michigan State University, and a master's degree in ecology, evolution and marine biology from University of California Santa Barbara (UCSB). After earning his doctoral degree in electrical and computer engineering in 2008, also from UCSB, he completed postdoctoral work in UC San Diego's Department of Chemistry and Biochemistry.

He received the 2012 Best Thesis Award from the Center for Control, Dynamical Systems and Computation, an honor awarded annually to a UCSB graduate student from the previous three years based on the originality, creativity and anticipated impact of his/her thesis.

Honors

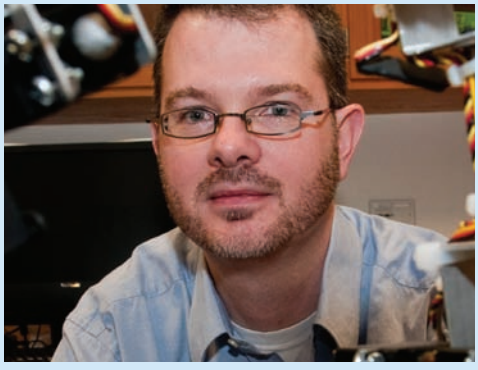
WILFRED CHEN, Gore Professor of Chemical Engineering, received the 2012 Biotechnology Progress Award for Excellence from the American Institute of Chemical Engineers for his contributions to biomolecular and protein engineering in the areas of bio-sensing and biofuel production.

THOMAS H. EPPS, III, associate professor of chemical and biomolecular engineering and a DuPont Young Professor, was named the Thomas and Kipp Gutshall Chair of Chemical and Biomolecular Engineering. Known for designing, building and characterizing new polymers, Epps generates nanoscale structures in soft plastics.

KRISTI KIICK, deputy dean of the College of Engineering and professor of materials science and engineering and biomedical engineering, was inducted into the American Institute for Medical and Biological Engineering College of Fellows Class of 2012 for her internationally known research in the area of biomaterials design, synthesis and characterization.

BABATUNDE OGUNNAIKE, William L. Friend Chair of Chemical Engineering and interim dean of engineering, was elected to the National Academy of Engineering for his contributions to advances in process systems, process engineering practice and systems engineering education. He was also inducted into the Nigerian Academy of Engineering's 2012 Class of Fellows at the University of Lagos, his undergraduate alma mater.

DARRIN POCHAN, professor of materials science and engineering, was named a fellow of the American Physical Society for his original and independent research in developing new nanostructures and functional materials through the assembly of soft materials, such as polymers and proteins, that can be designed to have biomedical applications in drug therapy or tissue regeneration.

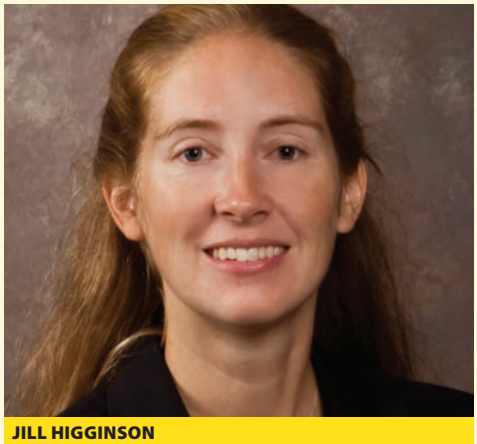


HERBERT TANNER, assistant professor of mechanical engineering, co-authored a paper on the design of inexpensive efficient spatially-distributed cellular neural networks that was voted the 2011 Outstanding Paper for the *International Journal of Intelligent Computing and Cybernetics*.

Selected Grants

THOMAS BUCHANAN


XINQIAO JIA


JILL HIGGINSON


KRISTI KIICK

THOMAS BUCHANAN, director of the Delaware Rehabilitation Institute, earned a five-year Center of Biomedical Research Excellence continuation grant totaling more than $5.4 million for osteoarthritis research.

JILL HIGGINSON, associate professor of mechanical engineering, was awarded a grant to develop a clinical immersion experience for UD's BME students in collaboration with partners throughout the Delaware Health Sciences Alliance. This course will enable students to experience current clinical practices, to identify unmet clinical needs and to discover future career options.

XINQIAO JIA, associate professor of materials science and engineering, together with researchers from Rice University and the Christiana Care Health System received a NIH RO1 grant to develop tissue engineering methods to restore the normal function of salivary glands in patients suffering from dry mouth syndrome.

KRISTI KIICK, deputy dean in engineering and professor of materials science and engineering, received a two-year grant for a collaborative research project with the Fraunhofer Center for Molecular Biotechnology to develop and demonstrate the ability of engineered polymer gels to increase the stability, immunogenicity and/or therapeutic efficacy of proteins.

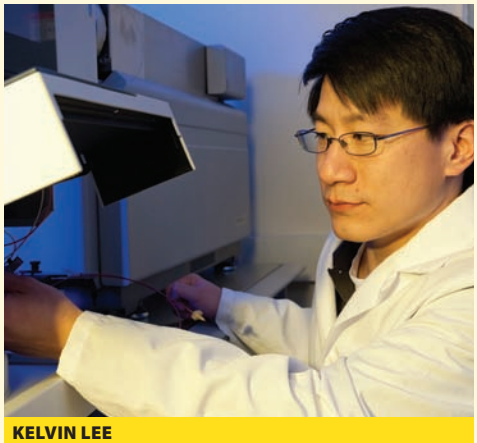
APRIL KLOXIN, assistant professor of chemical and biomolecular engineering, was awarded a University of Delaware Research Foundation grant to develop hydrogels for the controlled release of therapeutic drugs to treat skin cancers.

KELVIN LEE, Gore Professor of Chemical Engineering and director of the Delaware Biotechnology Institute, as principal investigator, was awarded a five-year $3 million National Science Foundation grant under the Integrative Graduate Education and Research Traineeship program to train doctoral students in the area of systems biology of cells in engineered environments.

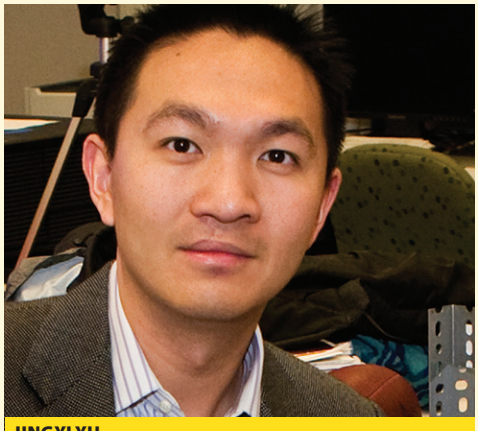

APRIL KLOXIN


LI LIAO


CATHY WU


KELVIN LEE


X. LUCAS LU


JINGYI YU

LI LIAO, associate professor of computer & information sciences and affiliated faculty, Delaware Biotechnology Institute and quantitative biology, was selected for scientific merit by Delaware's IDeA Networks of Biomedical Research Excellence program for his project to develop novel computational methods to predict protein-protein interaction sites for two proteins significant in cardiovascular disease.

X. LUCAS LU, assistant professor of mechanical engineering, was awarded a University of Delaware Research Foundation grant to develop a noninvasive mechanical technique for the early detection of osteoarthritis—the most common joint disorder—using proteoglycan, the second-most abundant component in cartilage, as a biomarker for arthritis diagnosis.

CATHY WU, Edward G. Jefferson Chair of Bioinformatics and Computational Biology, director of the Center for Bioinformatics and Computational Biology and of the Protein Information Resource, and professor of computer and information sciences and biological sciences, received a Delaware Bioscience Center for Advanced Technology grant for "Bioinformatics Optimization for Recombinant Protein Expression for Vaccines and Therapeutics," with the Fraunhofer Center for Molecular Biotechnology.

JINGYI YU, associate professor of computer and information sciences, was selected by Delaware's IDeA Networks of Biomedical Research Excellence program to develop a new immersive surgery training system called iSurg that will provide high-fidelity 3D reconstructions of actual surgical procedures so surgical trainees can witness and explore a recorded surgical procedure by navigating through space and time, as if they were there.

UNIVERSITY OF DELAWARE

College of Engineering

Biomedical Engineering
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