Introducing the New Faculty (Tenure and Tenure-Track) of Virginia Tech’s College of Engineering 2015-16 Academic Year

Nelie Loufakis, a student in Professor Chang Lu’s new Microfluidics Laboratory in the Department of Chemical Engineering in Goodwin Hall, works on microfluidic devices to analyze cells and study diseases.
The College of Engineering is pleased to present 34 new faculty for the 2015-16 academic year:

**Aerospace and Ocean Engineering**
- William Nathan Alexander

**Biomedical Engineering and Mechanics**
- Andrew R. Kemper
- Robin Queen
- Alexandrina Untaroiu
- Costin Untaroiu
- Vincent M. Wang

**Civil and Environmental Engineering**
- Matthew H. Hebdon
- Farrokh Jazizadeh Karimi
- Tripp Shealy
- Zhiwu (Drew) Wang

**Chemical Engineering**
- Michael J. Bortner
- Rong Tong

**Computer Science**
- Aisling Kelliher
- Na Meng
- Alla Rozovskaya
- Francisco Servant

**Electrical and Computer Engineering**
- Xiaoting Jia
- Vassilis Kekatos
- Pratap Tokekar
- Wei Zhou

**Engineering Education**
- Diana Bairaktarova
- Jacob Grohs
- Walter Lee

**Industrial and Systems Engineering**
- Blake Johnson
- Alejandro Salado

**Materials Science and Engineering**
- Carolina Tallón
- Hang Yu

**Mechanical Engineering**
- Alan T. Asbeck
- Pinhas Ben-Tzvi
- Jiangtao Cheng
- Weiwei Deng
- Azim Eskandarian
- Xiaoyu “Rayne” Zheng

**Mining and Minerals Engineering**
- Cheng Chen
W. Nathan Alexander received his Ph.D. in aerospace engineering from Virginia Tech in 2011. Afterwards, he remained at Virginia Tech as a postdoctoral associate, as a research scientist, and as a research assistant profes-
sor, all in the aerospace and ocean engineering department.

As a research assistant professor he studied aero/hydroacoustic noise sources and served as an affiliate faculty member in the Center for Renewable Energy and Aerodynamic Testing. His past research has focused on the noise produced by rotating machinery, airfoils, and rough surfaces as well as aeroacoustic measurement techniques.

When he was a postdoctoral associate he designed a 10-blade 457 millimeter diameter rotor that was capable of 4500 rotations per minute for entry into the Virginia Tech Stability Wind Tunnel. He also conducted measurements of roughness noise in the same wind tun-

Alexander’s research interests include: many aspects of fluid dynamics, flow-structure interaction, and flow generated noise. He has used many experimental tools to measure fluid flows and noise, including hotwire anemometers, pressure transducers, and microphone arrays. He has investigated turbulence ingestion noise from fans, rough wall boundary layer flows, step and gap flows, and wind turbines through experimental and theoretical analyses. He has a keen interest in fluid-structure interaction problems, and in propulsion noise from blade vortex interaction and combustion, and the noise from unmanned aerial vehicles, often dominated by the propulsion system.

As an experimentalist, he investigates advanced measure-

He is a member of the American Institute of Aeronautics and Astronautics, and served as a session chair on turbomachinery and propeller noise at its Aviation 2014 conference. He is also a member of the American Society of Mechanical Engineers.

He is one of several inventors of a noise reducing surface treat-
ment for airfoils, with a patent pending.

Alexander earned his bachelor’s degrees in ocean and in aero-
space engineering, graduating magna cum laude in 2007 from Virginia Tech. Two years later, he received his master’s degree in ocean engineering.

Andrew R. Kemper received his doctorate in biomedical engineering in 2010 from the Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences. After-

Kemper has been at Virginia Tech since he earned his bachelor’s degree in mechanical
In 2003, Kemper worked as a research associate for five years while simultaneously earning his doctorate degree.

Kemper’s research in the field of injury biomechanics specializes in characterizing the biomechanical response and injury tolerance of human and animal tissues under dynamic loading conditions and aims to identify and characterize the injury mechanisms associated with both automotive and military loading events.

The overall goals of Kemper’s research are to improve the understanding of human response and injury tolerance to impact loading and to provide validation data that are crucial for the development of improved anthropomorphic test devices (i.e., crash test dummies) and finite element models that are used to assess injury risk. The continued improvement of these tools allows researchers and safety engineers to more accurately evaluate the effectiveness of new and existing safety technologies, which are integral to the reduction of injuries and fatalities in civilian and military populations.

Kemper’s current active research grants are with Toyota Motor Corporation, the National Highway Traffic Safety Administration, B&W Pantex, LLC., U.S. Army Research Office, and the Department of Defense.

Kemper has made considerable contributions to the scientific literature through both authorship and service. He is the author or co-author of 27 refereed journal publications, 17 refereed conference publications, and one book chapter. In addition, his research has won awards at the International Stapp Car Crash Conference, the American Society of Mechanical Engineering Summer Bioengineering Conference, the Biomedical Engineering Society Annual Meeting, and the Biomedical Sciences and Instrumentation Symposium.

Kemper serves as a reviewer for a number of scientific meetings and 10 journals including: Traffic Injury Prevention, Journal of Biomechanics, Journal of Biomechanical Engineering, Annals of Biomedical Engineering, Journal of Applied Biomechanics, and the Journal of the Mechanical Behavior of Biomedical Materials. He is also a current member of the scientific program committee for the Association for the Advancement of Automotive Medicine.

Kemper is currently the committee chair for one Ph.D. student, the co-chair for one Ph.D. student, and a committee member for three Ph.D. students. He previously served on the committees of seven additional Ph.D. students and five master’s students. His teaching experience includes two graduate courses, Injury Physiology and Advanced Impact Biomechanics, and one undergraduate course, Introduction to Biomedical Engineering.

Robin Queen joins Virginia Tech from the Duke University Medical Center’s Department of Orthopaedics Surgery where she has been an assistant professor since 2013. She will direct the Kevin P. Granata Biomechanics Laboratory at Virginia Tech.

Raleigh, North Carolina has been her home since 2004 when she joined the Duke University Medical Center’s Department of Surgery in its Division of Orthopaedics. She spent two years as a research associate, and in 2005, simultaneously assumed the position of director of its Michael W. Krzyzewski (Coach K) Human Performance Laboratory and became a medical instructor.

In 2010 the division became the department of orthopaedics surgery, and she remained a medical instructor until 2013 when she
became an assistant professor, and stayed on as the director of the Coach K human performance laboratory until she left to join Virginia Tech. Queen received her bachelor’s degree in applied science with a minor in physics in 2000 from the University of North Carolina at Chapel Hill. One year later she earned her master’s degree from its School of Medicine’s Department of Biomedical Engineering and went on to earn her doctorate from the same program in 2004.

Her primary areas of research interest are: foot and ankle biomechanics; sports injury prevention; loading symmetry and the implications for joint damage; energy recovery as a measure of limb and functional decline, and the assessment of post-operative function.

Her work appears in three book chapters and in 79 refereed journal publications.

Among her awards, Queen received the 2010 Aircast Award for Clinical Science from the American Orthopaedic Society for Sports Medicine. She also received the Goldner Award for the Best Basic Science Paper from the 2011 American Orthopaedic Foot and Ankle Society. Her co-authored paper was titled, “Changes in Gait Mechanics Two Years Following Total Ankle Replacement.”

In 2013, the Orthopaedic Research Society awarded her entry as its Best Foot and Ankle Poster. That same year, she received the Southern Orthopaedic Association (SOA) Presidents’ Resident Award for her co-authorship of “Does a hindfoot Arthrodesis affect the results of total ankle replacement?”

In 2014 Queen was named a Fellow of the American College of Sports Medicine, and she was featured in the Spotlight on Women for the Orthopaedic Research Society.

She is a member of the following organizations: American Orthopaedic Foot and Ankle Society, Orthopaedic Research Society, American Academy of Orthopaedic Surgeons, American College of Sports Medicine, American Society of Biomechanics, International Society of Biomechanics and the Footwear Biomechanics Technical Group. She is currently the assistant editor of Foot and Ankle International and Bone and Joint Research.

Since obtaining her doctorate in mechanical and aerospace engineering from the University of Virginia (UVA) in 2006, Alexandrina Untaroiu has worked in UVA’s Rotating Machinery and Controls (ROMAC) Laboratory of the Mechanical and Aerospace Engineering Department.

She started as a research associate, and within two years was promoted to a research scientist. In 2011 she was named a senior scientist, a title she retained when she was also named the associate director in 2014. ROMAC laboratory has currently 42 industrial members from eight countries that pay a membership fee. As a result, the lab has approximately $1.1 million in annual funding.

Her research interests are: turbomachinery design and applications; computational and experimental fluid dynamics; optimization techniques; seals and fluid film bearings; rotor dynamics; artificial organs research; cardiac-assist devices; blood pump design; and prediction and quantification of blood damage and thrombosis in medical devices.

Untaroiu holds one U.S. patent on a streamlined and unobstructed one-pass axial flow pump. She has an international patent application on an axial-flow blood pump with magnetically suspended, radially and axially stabilized impeller. She has two provisional patents on a non-thrombogenic apparatus and method for reducing heart pump backflow and on an axial flow magnetically suspended ventricular assist system.
She has 29 publications in refereed journals, nine of which she maintains first authorship. She has an additional 27 refereed full-length papers in conference proceedings. She has served on committees for two Ph.D. and three master’s candidates.

She was a conference session organizer or chair of six different American Society of Mechanical Engineers’ (ASME) meetings: the 2012, 2013, 2014, and 2015 Turbo Expo Conferences; the 2014 International Mechanical Engineering Congress and Exposition, and the 2010 International Congress and Exposition.

Untaroiu is currently a journal reviewer for Tribology Transactions, the Journal of Engineering Tribology, the ASME Journal of Tribology, the ASME Journal of Fluids Engineering, the Building and Environmental International Journal, the American Society for Artificial Internal Organs Journal, and the Journal of Artificial Organs.

She holds her master’s degree in mechanical and aerospace engineering from UVA, earned in 2004. Her bachelor’s degree in mechanical engineering was awarded by the Politehnica University of Bucharest, Romania. Before starting her master’s in 2001, she worked as an engineer for Aversa Pumps S.A., of Bucharest, Romania.

Costin Untaroiu first joined the university in 2011 as a research associate professor in the Virginia Tech – Wake Forest University School of Biomechanical Engineering and Mechanics (SBES). His research interests are in biomechanics, modeling and simulation, finite element optimization, and probabilistic design.

Earlier, Untaroiu received one of his two doctorates in mechanical and aerospace engineering from the University of Virginia (UVA) in 2005. His first Ph.D. was awarded in 1999 by the Politehnica University of Bucharest, Romania. In 1996 he received a bachelor’s and a master’s degree in applied mathematics from the University of Bucharest, Romania. In 1990, he earned a bachelor’s and a master’s degree in mechanical engineering (ME), also from Politehnica University.

His professional experience before joining SBES includes a stint as a research engineer, R&D Diesel Engines, Faur S.A., Bucharest, 1990-91. He joined the ME department of Politehnica University as an instructor from 1991-93. He was promoted to assistant professor in 1993, and to a senior lecturer in 1997. He remained until 2001 when he joined UVA as an associate research scientist.

While in this position, he started his second Ph.D. After earning this degree, he remained for three more years at UVA as a research assistant professor until 2011.

He has advised two Ph.D. students to completion and three master’s candidates. He has mentored five undergraduate engineering students.

He has 57 refereed journal articles and another 85 conference papers, 64 of which are refereed. His name appears on four book chapters. During his combined years at UVA and Virginia Tech, he has received close to $25 million in funding of which his share is more than $4.5 million.

He is a member of seven editorial boards of technical journals, and a reviewer for another 40 journals. He is a peer reviewer for five government agencies.

Untaroiu received a best paper finalist award from the American Society of Mechanical Engineers (ASME) in 2014, advance vehicle technologies (AVT) section. In 2011, he received a certificate of recognition at the Society of Automotive Engineers’ (SAE) Congress and a certificate of appreciation from the National Aeronautics and Space Glenn Research Center. As a student, he won a third place, best paper award from the Stapp Car Crash Journal, an honorable
mention for best student paper at the ASME Summer Bioengineering Conference, and a student paper award from the International Society of Biomechanics (ISB), all in 2005. He was the valedictorian of his ME class at Politehnica University in 1990.

His name appears on one patent for a system and method for minimizing injury to vehicle occupants during crash events.

He is a member of SAE, Biomedical Engineering Society, American Society for Engineering Education, American Society of Biomechanics, ISB, ASME, and the American Helicopter Society.

Since 2005 Vincent M. Wang has served as the director of Rush University Medical Center’s Department of Orthopedic Surgery’s Sports Medicine Research Laboratory of Chicago, Illinois. He also became an assistant professor at the university’s orthopedic surgery department that same year.

Concurrently, he was named an adjunct assistant professor in 2006 at the University of Illinois at Chicago’s Department of Biomedical Engineering. In 2007, he received a joint appointment at Rush as assistant professor in the department of anatomy and cell biology. In 2014, he was promoted at both universities. The University of Illinois at Chicago named him an adjunct associate professor, and Rush University awarded him tenure and associate professor status in orthopedic surgery, with a joint position in anatomy and cell biology.

The primary focus on Wang’s NIH-funded research program is skeletal soft tissue healing. More specifically, his group seeks to develop therapeutic mechano-biologic strategies to effectively treat tendon disease. Wang has published extensively in the disciplines of orthopedic biomechanics and soft tissue repair.

He is presently an associate editor of Connective Tissue Research and BMC Musculoskeletal Disorders and serves on the editorial review board of the Journal of Orthopaedic Research as well as the editorial advisory board of Current Tissue Engineering. He has also served on numerous NIH grant review panels.

In 2014 Wang served as a mini-symposium co-organizer of the Institute of Electrical and Electronics Engineers (IEEE) Engineering in Medicine and Biology Society Conference session on image based biomechanics and predictive implant wear. From 2007 until 2010 he was a member of the program committee of the International Symposium on Ligaments and Tendons.

He is a member of the Orthopaedic Research Society (ORS), International Society for Hyaluronan Sciences, Rush Translational Sciences Consortium, and Biomedical Engineering Society. He currently serves on the Media Relations and Communications Committee of the ORS.

Among his honors, Wang received a 2011 Musculoskeletal Transplant Foundation Junior Investigator Grant and a National Institutes of Health Individual National Research Service Award from 2003 until 2005. In 1996 he received a first place award at the American Society of Mechanical Engineers’ Student Paper Competition, master’s level. His trainees have earned numerous national research and fellowship awards.

Wang’s name appears on two patent applications. One is for characterizing the cellular repair response after a soft tissue injury in diarthrodial joints and the second is for a therapeutic target for musculoskeletal inflammation.

Wang, a native of Blacksburg, received all of his degrees from Columbia University of New York. He earned his bachelor’s degree in mechanical engineering (ME) in 1994 and his master’s degree in ME/biomechanics in 1996. Both were from the Fu Foundation School of Engineering and Applied Science. In 1999 Columbia’s
Graduate School of Arts and Sciences awarded him his master’s of philosophy degree in ME/biomechanics and in 2001 his doctorate in the same field of study.

**CIVIL AND ENVIRONMENTAL ENGINEERING**

Matthew H. Hebdon, Professional Engineer (PE), received his doctorate in civil engineering in 2015 from Purdue University. Previously, he earned a master’s and a bachelor’s degree in civil and environmental engineering (CEE) from Utah State University in 2005.

He worked as a structural design engineer at Sargent Engineers, Inc., from 2005 until 2010. As a licensed PE, his responsibilities included the structural design of residential and small commercial buildings, as well as inspection of bridges for structural deficiencies.

Among his academic honors, he graduated summa cum laude from Utah State University in 2005. Additionally, he was named as both the outstanding sophomore and the outstanding senior for the CEE department.

In his doctoral studies, Hebdon investigated the member-level redundancy of built-up steel girders by testing full-scale specimens for fracture resilience and remaining fatigue life of partially failed members. He further analyzed the localized stress redistribution and behavior of partially failed built-up girders using three-dimensional finite element analysis to perform a parametric study.

Other research experience has included the field instrumentation and monitoring of in-service bridges, comparative study of three different data-acquisition systems for load rating in-service bridges, system-level redundancy evaluation through fracture testing of full size bridges, and a finite element parametric study of steel-slit panel frames being developed to be used as a lateral force resisting system.

He has taught certain aspects of the Introduction to Structural Mechanics and the Behavior of Metal Structures classes at Purdue. He served as the structural engineer and co-captain of Purdue’s team in the U.S. Department of Energy Solar Decathlon competition. In his position, he taught students about the application of current building codes, led a student team in the development of structural design documents, and co-led students in the construction phase of the project including training on construction techniques as well as safe and proper use of construction tools.

He is a member of the American Society of Civil Engineers, the American Institute of Steel Construction, the American Railway Engineering and Maintenance-of-way Association, and Tau Beta Pi. He has worked with Engineers Without Borders on a project in Peru, as well as the Eagle Condor Humanitarian organization in Peru.

Farrokh Jazizadeh Karimi’s research interests are at the intersection of data management, data driven informatics, and built environment sustainability and adaptability. He is interested in leveraging the dynamics of the built environment towards improved and flexible performance at different scales from building/facilities to regional/urban levels.

The economic and sustainable maintenance and growth of the urban infrastructure have gained significant attention in recent years. The dynamics between different entities (buildings, energy networks, users, etc.) plays a major role in sustainable and efficient management. Context aware management of operations
in these infrastructures could therefore improve their adaptability and efficiency, enable integration of renewable energy sources, and reduce the dependency on fossil fuels.

Accordingly, Karimi’s academic vision is to move towards realization of sustainable infrastructures in smart cities, where there is a bidirectional flow of information among facilities, users, and regional infrastructure to achieve cyber-physical systems (CPS) solutions capable of increasing adaptability for sustainability and resiliency.

Karimi received his doctorate in civil engineering with a focus on informatics for intelligent built environment from the University of Southern California (USC) at Los Angeles in 2015. His Ph.D. followed two master’s degrees, also earned from USC’s Viterbi School of Engineering in computer science (2013) and in civil engineering (2011). Prior to his Ph.D. studies, Karimi attended the Isfahan University of Technology, Isfahan, Iran, where he obtained his bachelor’s degree in civil engineering in 2002 and Amirkabir University of Technology, Tehran, Iran, where he earned a master’s degree in civil engineering in 2004.

His doctoral dissertation focused on enabling energy aware facilities through the application of non-intrusive load monitoring (NILM) as a low-cost alternative to appliance level sensing. NILM uses few sensing nodes in buildings, coupled with specialized machine-learning and signal processing algorithms to infer operational schedules of individual loads.

He is the author of 12 peer-reviewed journal publications in high impact journals and 15 peer-reviewed conference publications in international conferences. His name appears on two filed patents. One is on the human-building interaction framework for personalized comfort driven system operations in office buildings. The second is on an autonomous pavement condition assessment system. He is also a technical reviewer for seven journals and two international conferences and a member of American Society of Civil Engineers and several technical committees.

Among his achievements, he is the recipient of several awards and honors including the USC’s Ph.D. Achievement Award (2015), Arek Mekertichian Award of Excellence in Engineering Education from the Association of Professors and Scholars of Iranian Heritage (2015), membership of Phi Kappa Phi Honor Society (2014), USC’s Department of Civil and Environmental Engineering’s Outstanding Research Assistant Award (2013) and Outstanding Teaching Assistant Award (2012).

He has served as a teaching assistant (TA) for ten courses at USC’s Astani Department of Civil and Environmental Engineering. Throughout his Ph.D. studies at USC, he has also served as a mentor to several students at different levels including undergraduate students, master students, and first year Ph.D. students. He has also seven years of professional industry experience prior to moving to the U.S. to pursue his Ph.D. studies. He has diverse experience in design and construction of civil infrastructures as project manager, design manager, and design engineer from 2002 to 2009.

Tripp Shealy is a three-time civil engineering (CE) graduate of Clemson University. He received his bachelor’s degree in 2010, his master’s in 2013, and his doctorate in 2015.

While obtaining his doctorate he was the primary instructor for the construction section of the CE Capstone Design course. He guided students through project estimating, scheduling, and sustainability concepts. He also developed two additional online courses: Are Codes Enough? Disaster Mitigation and Residential Buildings and Sustainable Construction.

Shealy was a primary instructor for Clemson’s Youth Learning
Institute. For the institute, he developed a departmental program offered to South Carolina high school juniors and seniors to explore CE systems and concepts. He taught students about buoyancy, structural mechanics, material properties, life cycle assessment, green infrastructure, and passive design using games and hands-on learning activities.

His research focus is on judgment and decision making for sustainable infrastructure. He targets underexplored areas by applying concepts from psychology, behavioral economics, and data science to implement cost effective ways to guide stakeholders in the infrastructure development process towards decisions that lead to more sustainable outcomes. His research interest also includes how themes related to sustainability can attract new students to study engineering.

Since 2014 he has consulted with Harper Corporation’s Environmental Services Division. From May of 2012 until August of 2013 he acted as the engineering and technical programs researcher for the Federal Alliance for Safe Homes of Tallahassee, Florida. From June of 2010 until September of 2011 he was a project engineer for Crowder Construction Company of Greenville, South Carolina. There, he worked on a $30 million water treatment plant upgrade in Chesnee, South Carolina. He also contributed to a $1.8 million design and building of a water treatment plant in Spartanburg, South Carolina.

While an undergraduate he was an intern for Seamon, Whiteside and Associates of Charleston, South Carolina.

He is a member of the American Society of Civil Engineers, the American Society for Engineering Education, the United States Green Building Council, the National Charrette Institute, and the Congress for the New Urbanism. He was a session moderator for the 2014 Engineering Project Organization Conference and a reviewer for the American Society for Engineering Education and Construction Research Congress.

Since December, 2011 Zhiwu (Drew) Wang has served as a visiting assistant professor at The Ohio State University. For the past year, he has handled additional responsibilities as director of the renewable energy program.

At OSU, Wang pursued a number of research projects including: development of a unique biogranulation process for agricultural drainage water treatment; research of the solid-state anaerobic digestion technique; development of a copyrighted software program for anaerobic digester simulation; and the establishment of an advanced bioenergy laboratory.

He also developed syllabi for and taught six courses including topics relating to waste-to-bioenergy conversion and feedstock evaluation and analysis. He also lectured in environmental resource, agricultural business, and Upward-Bound programs.

Prior to joining OSU, Wang was a postdoctoral research associate at Oak Ridge National Laboratory from 2009 until November 2011. During this appointment, he focused on environmental engineering and bioenergy related research. Wang invented a thermophilic flow-cell system for real-time imaging of microbial cellulose utilization for ethanol production under anaerobic conditions. He also was able to determine the life cycle of cellulolytic bacteria on the cellulosic biomass surface.

An earlier stint found Wang serving as a postdoctoral research associate at Washington State University from 2007 until 2009. At WSU he developed a selection pressure-driven high-rate anaerobic digestion process for dairy manure treatment and biogas production. He also invented a household small-scale anaerobic digester and
provided consultant service to the Pacific Natural Food Corporation for dairy and food processing waste management.

Wang earned his Ph.D. in environmental engineering in 2007 from Nanyang Technological University of Singapore. His Ph.D. research was focused on the cultivation of aerobic granular sludge for water purification by removing organic, nutrient and heavy metal pollutants.

His bachelor’s degree, also in environmental engineering, was awarded in 2000 by the Harbin Institute of Technology, Heilongjiang Province, China.

During his academic career he has published 25 peer-reviewed journal papers, 15 book chapters, and four invention disclosures. He has been the principal investigator on $772,000 in grants.

Among his honors, along with his advisee Fuqing Xu, Wang took first place in the 2014 American Society of Agricultural Biological Engineers’ Boyd-Scott Graduate Research competition. In 2013 he served on the editorial board of the Journal of Environmental Sciences.

He is a member of the International Water Association, Association of Environmental Engineering and Science Professors, American Society of Agricultural and Biological Engineering, Water Environment Federation, Federal Water Quality Association, and Virginia Water Environment Association.

CHEMICAL ENGINEERING

Michael J. Bortner, who as an instructor received the Sporn Award for excellence in teaching engineering subjects from the Virginia Tech undergraduate students in 2015, has now accepted a tenure track position in chemical engineering (ChE).

Bortner received his Ph.D. in ChE from Virginia Tech in 2003. Advised by Don Baird, who holds the Alexander Giacco Professorship, Bortner concentrated in non-Newtonian fluid mechanics, composite and polymer processing, and green engineering. Subsequently, he joined an entrepreneurial company, spun off from research conducted at Virginia Tech called NanoSonic, Inc., as its vice president of manufacturing process development.

While at NanoSonic, Bortner developed new material technologies. Among them, he was a co-inventor of the HybridSil® nanocomposite technology that developed into a multi-million dollar a year core business. HybridSil®, a technology that focuses on protective coatings, used in composites for ballistic, blast, anti-corrosion, anti-icing, and high temperature / thermal protection, received a 2011 R&D 100 Award. The magazine presents this international award to its choice of the top 100 most technologically significant new products of the year. R&D labels it the “Oscars of Invention.”

Bortner was also part of the NanoSonic team that built a 10,000 square foot HybridSil® pilot scale manufacturing facility. At this facility, he helped develop and scale-up multiple polymer nanocomposite synthesis and processing techniques.

Bortner left NanoSonic in 2013 and subsequently joined the ChE department as an instructor and primary undergraduate advisor. In this role, Bortner taught core-level junior classes, provided curriculum and career advising, and lead multiple department service initiatives. His teaching of the fluid mechanics and unit operations laboratory won him a “Favorite Faculty Award” from the students in 2014. Among his teaching techniques, he promoted interactive learning using electronic note taking, team-based in-class quizzes, and class flipping to build problem solving abilities. He also engaged in diversity and outreach programs for current, incoming, and potential students.
He has 10 refereed journal publications and five refereed technical papers. His name also appears on 10 industry patent applications. He serves as a referee for Polymer Engineering and Science, Journal of Undergraduate Materials Research, and Polymer International.

Bortner received his master’s degree in ChE from Virginia Tech in 2002 and his bachelor’s degree, also in ChE, from Penn State in 1998. He has also served as an adjunct professor in materials science and engineering at Virginia Tech since 2008.

Since 2010 Rong Tong has worked as a postdoctoral associate at the Massachusetts Institute of Technology, and Children’s Hospital Boston, Harvard Medical School. In this position, he is credited with developing photo-switchable nanoparticles for light triggered release of chemotherapeutics to treat cancers. This technology has enhanced tissue penetration properties and improved in vivo efficacy results. He was the lead on the use of photo-caged aptamer for in vivo tumor imaging with minimized distribution in livers and in kidneys.

Tong also developed nanoparticles that target tumor desmoplasia with minimal systemic toxicity, through the collaboration with Massachusetts General Hospital. He was involved in the use of polymeric biomaterials to deliver local anesthesia and ocular drugs through the cornea for intra-ocular disorder.

His work on photo-switchable nanoparticles was featured on the Journal of the American Chemical Society cover, and Nature News reported on his “On-demand drug release” in 2012. In 2013, Chemical and Engineering News highlighted his in vivo light-triggered chemotherapeutic work in an article titled “Improving Drug Delivery.” Among his awards and honors he received the 2011 AkzoNobel Award for outstanding graduate research in polymer chemistry from the American Chemical Society. In 2009 the University of Illinois at Urbana Champaign awarded him its Racheff-Intel Award for excellent graduate research. The university also presented him with the best poster award at its 2007 Siteman Cancer Center for Nanoscale Science and Technology Nanotechnology Symposium.

His teaching experience includes a stint as a teaching assistant at University of Illinois and laboratory demonstrator in MIT’s Advances in Control Releases Technology course.

His name appears on two provisional patents for the controlled formulation of a nanoparticle and for the preparation of small molecule ligand-drug conjugates for targeted cancer therapy. He shares an international patent on particulate drug delivery.

Tong received his bachelor’s degree in macromolecular science in 2005 from Fudan University of China. He earned his doctorate five years later in materials science and engineering from the University of Illinois at Urbana-Champaign. During his tenure at Illinois, he developed several new technologies, mostly related to cancer research.

COMPUTER SCIENCE

For the past three years Aisling Kelliher has worked at Carnegie Mellon University’s (CMU) School of Design as an associate professor, where she also served as adjunct faculty in CMU’s Human-Computer Interaction Institute (HCII). She co-directed CMU’s Masters in Tangible Interaction Design program in the School of Architecture and lead transdisciplinary
research in the Visible Process Lab.
Kelliher creates and studies interactive media systems for enhancing reflection, learning, healing, and communication. Her work is grounded within the fields of human-computer-interaction, multimedia, and interaction design, and is motivated by a desire to integrate computational processes into everyday mediated experiences.

Her current research explores the role of design in multiple interdisciplinary contexts including healthcare, learning cultures, and future studies. Working with colleagues in computer vision and machine learning, she is developing a home-based interactive neurorehabilitation system for stroke survivors. She has also worked on developing XSEAD.org, an online platform supporting networks of creativity and innovation across science, engineering, art, and design. The platform is currently being extended to support MakeSchools.org, a shared online knowledge base for U.S. universities involved in the maker movement. Kelliher is also an advocate of speculative design practice and engages in research integrating design and future narratives.

Findings from her research have been published in high-impact journals and conferences including ACM Multimedia, SIGCHI Conference on Human Factors in Computing Systems, World Wide Web, International Symposium on Electronic Arts, Futures Journal, and exhibited at leading national venues including SIGGRAPH, the Arizona State University Art Museum, and the DeCordova Museum. Her research is supported by grants from the MacArthur Foundation, SIU Norway, and the National Science Foundation.

She serves as a reviewer for more than 15 journals and conferences and will be one of the program chairs for the ACM Multimedia conference in 2016. She writes a regular column called “Artful Media” for the Institute of Electrical and Electronic Engineers’ MultiMedia magazine, and is also the technical correspondent for the radio show “Culture File,” broadcast weekly on Irish national radio.

A native of Dublin, Kelliher holds a bachelor’s degree in communications studies from Dublin City University and a master’s degree in multimedia systems from Trinity College, Dublin. In 2007, she graduated from the MIT Media Lab with a Ph.D. in media, arts, and sciences.

After receiving her doctorate in computer science from the University of Texas (UT) at Austin in December of 2014, Na Meng worked as a postdoctoral researcher, with her advisors: Miryung Kim and Kathryn S. McKinley.

For the past six years she has focused her UT work on: generating program transformations from code change examples; locating and applying systematic edits by learning from examples; and exploiting systematic edits for refactoring.

She also worked as a research intern with the RISE group at Microsoft Research during the fall of 2013. While in this position, she designed and implemented an approach to improve accuracy of applications that base computations on noisy estimated data from hardware sensors, machine learning, and crowd sourcing. Her approach, when implemented in a specific game called Simon, improved the accuracy from 60 percent to 89 percent.

Her teaching experience includes two semesters in the classroom at Peking University and one at UT. She worked as a teaching assistant for a graduate level software engineering course and an undergraduate level software engineering course.

Among her honors, Meng received an IBM scholarship in 2004 and a Hewlett-Packard scholarship in 2005. Northeastern University in China awarded her an Excellent Bachelor Thesis for her work in
the software engineering department in 2006. Peking University presented her with its Excellent Learning Award in 2007. UT’s College of Natural Sciences honored Meng with a Dean’s Excellence Award.

She is a reviewer for the Journal of Systems and Software. She was a reviewer of the 2015 Artifact Evaluation for CGO and PPoPP and the 2015 12th Working Conference on Mining Software Repositories. In 2013 she was a reviewer for the Journal of Empirical Software Engineering. She served as a sub-reviewer for the following: the 2014 International Symposium on Foundations of Software Engineering; the 2011 International Conference on Software Maintenance; the 2011 Conference on Programming Language Design and Implementation; and the 2010 International Symposium on Empirical Software Engineering and Measurement.

She has 11 publications to her credit.

For the past two years Alla Rozovskaya has worked on an automated system for a spelling and grammar correction project for the Arabic texts as a postdoctoral research scientist at Columbia University’s Center for Computational Learning Systems.

With a 2013 doctorate in computational linguistics from the University of Illinois at Urbana-Champaign, she has worked on natural language processing (NLP), statistical and machine learning methods in NLP, and NLP for educational purposes and for social media.

Rozovskaya has three master’s degrees to her credit. Two are also from the University of Illinois: computer science in 2010 and linguistics in 2007. Her third master’s degree is in French studies, received in 2003 from the State University of New York at Albany. Her undergraduate degree in English philology with honors was received in 1997 from the Institute of Foreign Languages, Tashkent, Uzbekistan.

Among her awards, she was an invited participant in the Rising Stars in Electrical Engineering and Computer Science Workshop at the University of California, Berkeley in 2014. With colleagues from Columbia University, she also built an automated system that received a top ranking in the CoNLL Shared Task on Grammatical Error Correction in English, also in 2014. The 2014 QALB Shared Task on Automatic Arabic Error Correction awarded Rozovskaya and her same colleagues first place for the automated system they built.

With collaborators at the University of Illinois, she built an automated system that ranked first in several international competitions in text correction in English. These competitions were: Helping Our Own, 2011; Helping Our Own, 2012; and CoNLL Shared Task, 2013. With collaborators while obtaining her linguistics and computer science master’s degree, she built a semantic parser that ranked first in the SemEval-2007 Shared Task on Classification of Semantic Relations between Nominals.

While at Illinois, she received a Beckman Cognitive Science/Artificial Intelligence Summer Fellowship in 2007. She also had a departmental fellowship that same year.

Rozovskaya is a reviewer for the following publications: Journal of Natural Language Engineering; Transactions on Asian Language Information Processing; Traitement Automatique des Langues Journal; and Information Processing and Management Journal. She has served on 14 national and international conference program committees.

Francisco Servant received his doctorate in software engineering in June 2015 from the
University of California, Irvine. His master’s diploma in information and computer sciences was awarded six years earlier from the same university. He received his bachelor’s degree in computer science in 2005 from the University of Granada, Spain.

For the past seven years he has worked as a graduate student assistant, conducting research in mining software repositories, software analysis, and computer-supported collaborative work. His research focuses on software development productivity and software quality. He uses software evolution analysis and program analysis to create practical, efficient, and human-friendly techniques and tools that provide automatic support for all stages of software development.

He held three different internships: with Microsoft Research, Redmond, Washington, summer of 2011; DreamWorks Animation, Glendale, California, summer of 2008; and Valeo Lighting Systems, Martos, Spain, fall of 2004. He also worked as a development support engineer for Microsoft Corporation of Madrid, Spain from July 2005 until July 2007.

Servant has six peer-reviewed publications and ten invited presentations. He served as a teaching assistant in six different courses and was a guest lecturer in another four. All were in the software engineering area.

He is a reviewer for the Journal of Internet Services and Applications, the Journal of Systems and Software, and the Central European Journal of Computer Science. He served as an external reviewer for: the 2014 International Symposium on the Foundations of Software Engineering; the 2012, 2013, and 2014 International Conferences on Software Engineering; and the 2013 Working Conference on Software Visualization, both the Tool Track and the NIER Track. He also served in the program committee of the 2012 International Conference on Program Comprehension, Tool Track, and the 2012 International Working Conference on Mining Software Repositories, Mining Challenge Track.

Among his awards, he held the Caja Madrid Foundation Fellowship for Graduate Studies from 2007 until 2009, a Dean’s Fellowship from the Donald Bren School of Information and Computer Sciences from 2009 until 2013, a SIGSOFT-CAPS Travel Award for ICSE in 2012, and a National Science Foundation Award for VISSOFT in 2013.

He is a member of the Institute of Electrical and Electronic Engineers, the Association for Computing Machinery, the Special Interest Group on Software Engineering, and the Institute for Software Research at the University of California, Irvine.

ELECTRICAL AND COMPUTER ENGINEERING

Xiaoting Jia spent the past three years as a postdoctoral associate at the Massachusetts Institute of Technology’s (MIT) Research Laboratory of Electronics (RLE).

In this capacity, she has designed and developed multifunctional polymer fibers for studying neuron-fiber interfaces and interactions. She has also conducted in vivo and in vitro studies of fibers with electrical recordings, drug delivery, and optical guidance functions as neural probes and neuron scaffolds.

Her work has also allowed her to investigate semiconductor materials synthesis inside fibers for solar energy harvesting and conversion applications. She has also explored structural properties of silicon nanospheres in silica fibers formed by capillary instabilities.

Leading up to her doctorate in materials science and engineering from MIT in 2011, she worked for five years in the research group of
MIT’s institute professor Mildred Dresselhaus. During that time Jia conducted a detailed study of structural, electrical, and electronic properties of two dimensional materials, with a focus on graphene nanoribbons and graphene edges. She also developed a method to modify rough edges in graphene nanoribbons to form atomically smooth edges using an in-situ transmission electron microscopy (TEM) method.

During this tenure, Jia also conducted a detailed study of edge-edge interactions in graphene platelets and edge-folding and investigated the synthesis and structural properties of CVD-grown graphene, boron-nitride thin films, the structural and electrical properties of bismuth and related thermoelectric materials.

From 2004 until 2006 she pursued her master’s degree, also in materials science and engineering, at Stony Brook University of New York. She worked in the crystal growth and characterization laboratory, conducting a detailed study of the surface and crystalline defects in SiC/GaN/AlN (silicon carbide, gallium nitride, and aluminum nitride) using several measuring techniques.

She served as a teaching assistant at both MIT and Stony Brook in three different courses: Fundamentals of Materials Science and Engineering, Structures of Materials, and Thermodynamics.

Among her awards, MIT named her the Translational Fellow of RLE in 2013. In 2011 the American Physical Society presented her with its Ovshinsky Student Travel Award. The Materials Research Society gave her the Graduate Student Gold Medal Award in 2010. She had a departmental fellowship at MIT and a presidential fellowship at Stony Brook.

At Fudan University where she received her undergraduate degree in materials science in 2004, Jia was named an excellent student in both 2001 and 2002, and received the Top Class Scholarship, sponsored by ExxonMobil, in 2001.

Her name appears on 23 journal publications and on three patents.

Vassilis Kekatos is a three-time graduate of the University of Patras, Greece. He received his five-year degree in computer science and engineering in 2001, his master’s in signal processing in 2003, and his doctorate in computer science and engineering in 2007.

The same year he earned his first degree, he co-founded ADEN Ltd., in Patras, Greece. The company delivered custom information technology solutions for small- and medium-sized enterprises. From 2002 until 2006, he worked as a signal processing engineer for the Computer Technology Institute, also in Patras. He programmed image watermarking algorithms and implemented and validated voiceprint models for speaker verification.

In 2007, he was a communication engineer with Scientis Ltd., of Patras; while in 2008, he performed his mandatory service with the Greek Navy as a communication engineer.

In 2009, Kekatos became a postdoctoral researcher, working with both the University of Minnesota’s SPINCOM Group and the University of Patras' Signal Processing and Communications Group. Among his accomplishments, he designed outlier-resilient and kernelizable clustering schemes for big data analysis. He also introduced robust sensing and solved its relaxations by judiciously designed algorithms.

In 2013, Kekatos moved to the University of Minnesota to continue his work but only with the SPINCOM Group for the next year. As a research associate, he engineered a framework for a decentralized power system state estimation scalable to grids having thousands of buses. He applied risk-aware optimization for dispatching...
renewable energy resources.

He also predicted day-ahead electricity prices via low-rank regularization and developed efficient algorithms for multi-kernel learning; devised block-sparse models for bad data removal and circuit breaker status verification; derived methods for optimally placing phasor meters via a semi-definite program; engaged compressive censoring in online reconstruction from big data; and posed preferential management as matrix completion with missing and censored entries.

In 2014, he moved to the University of Texas at Austin as a visiting researcher, and then to Ohio State University in the same capacity. He has taught as an adjunct professor at the University of Minnesota and at the University of Patras. For the past five years, he has supervised seven graduate students at the University of Minnesota on topics related to energy systems.

Among his awards, he was rated number one in computer engineering in university placement exams in Greece in 1996. In 2000 he received a Distinguished Scholar Award given to only the top one percent of the students by the Technical Chamber of Greece. From 2009 until 2012 he held a Marie-Curie Fellowship, while in 2014 he received the postdoctoral career development award from the University of Minnesota.

Pratap Tokekar earned his bachelor of technology degree in electronics and telecommunications from the University of Pune, India in 2008. He was accepted into the University of Minnesota’s graduate program and received his doctorate in computer science in 2014.

While earning his doctorate, Tokekar spent two weeks as a visitor at the Max-Planck Institute for Biological Cybernetics, Tübingen, Germany in 2013. Between September of 2014 and July of 2015, he was a post-doctoral researcher at the University of Pennsylvania’s General Robotics, Automation, Sensing and Perception (GRASP) lab.

His research focuses on multi-robot systems. In particular, he is studying search, coverage, tracking, and active perception algorithms with theoretical performance guarantees. This research finds immediate applications in environmental monitoring and precision agriculture, and he often collaborates with researchers from these areas to develop and deploy robots in the field.

Along with his colleagues, he has applied for two patents on the use of unmanned aerial vehicle and unmanned ground vehicles in precision and specialty farming. He has written six journal articles, two book chapters and ten published, refereed conference proceedings.

He has co-organized a workshop on robotics in agriculture for the 2015 International Conference on Robotics and Automation (ICRA), the Institute of Electrical and Electronic Engineers’ (IEEE) flagship conference and premier international forum for robotics researchers. In 2012 he was a session co-chair at ICRA. He also worked on the program committee for the Second Workshop on Robotic Sensor Networks, part of the 2015 Cyber-Physical Systems week, and will serve on the program committee of the Intelligent Robots and Multi-Agent Systems track at the ACM Symposium on Applied Computing, 2015. He will also be a guest editor for the special issues on Active Perception for the Autonomous Robots journal and Robotics in Agriculture for the Journal of Field Robotics.

Wei Zhou has spent the past three years as a postdoctoral fellow in Charles Lieber’s group at Harvard University, focused on nanoelectronics for biology and healthcare applications. In the Lieber group, Zhou has developed a large-area nanowire transfer technique to fabricate flexible three-dimensional macroporous nanoelectronic scaffolds for synthetic cyborg tissues. He has recently demonstrated three-dimensional real time electrical mapping and regulation of cardiac action potential propagations in three-dimensional nanoelectronics innervated heart tissues.

In another demonstration, Zhou showed that nanoelectronic devices can be used to detect biomolecules in high-ionic physiological solutions by employing a nano-porous polymer layer on the surface of nanowire field-effect transistor detectors. He also developed a simple technique to make a bio-inert coating to achieve a long-term stability of nanowire nanoelectronic sensors in physiological environments for more than 100 days.

In 2012, Zhou graduated at Northwestern University with his Ph.D. thesis on “Manipulation and Amplification of Light in Strongly Coupled Plasmonic Nanocavity Arrays.” His Ph.D. study focused on designing, making, and exploiting novel plasmonic nanostructures for applications including biosensors, nanolasers, photodetectors, and solar cells. His research also involved developing and improving soft nanolithography techniques for large-scale low-cost fabrication of nanophotonic structures.

As he develops his own research program at Virginia Tech, Zhou will focus on nano-enabled photonic and electronic materials, devices, and systems targeting applications in the interdisciplinary areas of information technology, healthcare, and energy. The initial stage of his research will include: plasmonic-enhanced optoelectronics, photovoltaics, and nonlinear-optics; label-free plasmonic biosensors; and flexible networks of electronic and optoelectronic nanoscale devices in healthcare and life science.

His teaching experience is varied. At Harvard, he served as a mentor for the students in the chemistry and chemical biology department. While obtaining his doctor’s degree at Northwestern, he was a teaching assistant for graduate classes in the materials science department. In addition, he served as a mentor at Northwestern on an Undergraduate Research Experience program sponsored by National Science Foundation. At Shanghai Jiao Tong University, he was a teaching assistant in the physics department for one academic year.

Among his honors, Zhou received the 2012 Chinese Government Award for Outstanding Self-Financed Student Abroad. In 2011 Northwestern University presented him its International Institute for Nanotechnology Outstanding Research Award. At Northwestern, he has also won other highly selective fellowships including Ryan Fellowship (2009-2011), and MRSEC Fellowship (2009-2012). In addition, Shanghai Jiao Tong University gave him a 2006 National Excellence Award.

He holds three Chinese patents for fabricating specific materials, and has a patent application in process in the U.S. His name appears on 26 publications in journals such as Nature Nanotechnology, Nano Letters, American Chemical Society Nano, and Proceedings of the National Academy of Sciences.

Zhou received his doctorate in material science and engineering from Northwestern University in 2012. Shanghai Jiao Tong University awarded him a master’s degree in optics in 2007 and a bachelor’s degree in physics in 2004.

ENGINEERING EDUCATION

For the past two years Diana Bairaktarova was an assistant professor of engineering practice in the Aerospace and Mechanical Engineering Department of the University of Oklahoma’s College of Engineering. She taught six different courses at Oklahoma. At the undergraduate level, she focused on: Spatial Reasoning and Engineering Graphics, Thermodynamics, Dynamics, Design and Manufacturing Processes, and Interactive Engineering Design Graphics. At the graduate level Bairaktarova taught User Experience Design, where the design of artifacts was addressed from a multidisciplinary perspective that includes opportunity determination through inspiration, ideation, and implementation using design thinking framework.

In her position at Oklahoma, Bairaktarova also participated in the industrial systems engineering summer camp, introducing high school students to concepts and tools for computer aided design and rapid prototyping. And she served as the faculty advisor for the Sooner-Off Road or Baja student team for two years.

Oklahoma was her first position after receiving her doctorate in 2013 from Purdue University’s School of Engineering Education. Her thesis was on an experimental study of how the presence of mechanical objects affects students’ performance on engineering related tasks.

While studying for her doctorate, she was a Faculty Fellow for two semesters, engaging students with lesson plans created to optimize problem solving and to provide team-based and active learning. Her goal was to also ensure retention of essential course objectives by developing an engrossing curriculum that included presentations, assessments, and high-impact pedagogical approaches.

Bairaktarova was a research assistant at Purdue from spring 2010 until the summer of 2013. She designed and implemented research studies on the use of observational protocol to identify engineering thinking in young children; the use of human-artifact interactions in engineering education; the role of personality factors in engineering students’ ethical decisions; and creativity and science, technology, engineering and mathematics (STEM). In fall 2012 she was a project facilitator for Purdue’s Pre-college Outreach Program of the Minorities Engineering Program.

She pursued her Ph.D. after several positions with industry. From 2008 until 2009 she was a manufacturing engineer with NAPCO International of Hopkins, Minnesota. From 2003 until 2008 she was a Module Design and MMIC test engineer for TLC Precision Water Technology of Minneapolis, Minnesota. From 1994 until she moved to the U.S. in 2000, she was an operations engineer with Eurologistic, Ltd., of Sofia, Bulgaria.

She is a member of the Society of Women Engineers, the Graduate Engineering Education Consortium for Students, the American Society for Engineering Education, and the European Society of Engineering Education. She is an associate member of the Sigma-Xi Science and Engineering Honored Society and the Golden Key International Honor Society.

She is an author on seven journal papers, and one book chapter on creativity and science, technology, engineering, and mathematics in early childhood education. She has served as a reviewer for the Materials Research Society meeting.

Bairaktarova received her master of business administration in 2009 from the Hamline School of Business, St. Paul, Minnesota. She earned her bachelor and master’s degrees in mechanical engineering in 1991 and in 1993, respectively, from the Technical University of Sofia, Bulgaria.

Jacob Grohs holds four degrees from Virginia Tech: a bachelor's degree in engineering science and mechanics, summa cum laude in 2008; a master’s degree in engineering mechanics in 2009; a master’s and a Ph.D. in education in curriculum and instruction in 2012 and in 2015, respectively.

For the past year he has worked as an instructor in Virginia Tech's Department of Biomedical Engineering and Mechanics. He taught multiple sections of large lecture courses in engineering mechanics.

His research interests focus on understanding how individuals reason through complex ill-structured problems and the learning environments and experiences that cultivate such a capacity. He also studies aspects of learning and development that help students become reflective, proactive regulators of their own engagement and learning.

During the 2013-14 academic year, Grohs was the associate director for engaged learning and scholarship, part of VT Engage: The Community Learning Collaborative. His duties included: the coordination and expansion of the Students Engaging and Responding through Volunteer Experiences Living-Learning Community (SERVE LLC); and the instruction of the Exploring Citizen Leadership course series and the supervision of the SERVE graduate assistant and student leaders in fulfilling their job duties. He also oversaw co-curricular student engagement efforts, supervised a full-time professional staff member, and managed the budget for VT Engage student engagement, faculty development, and assessment efforts. He also developed and implemented assessment tools for student learning outcomes and community partnerships.

From 2009 until 2013 he worked with the Student Engagement Programs of Virginia Tech. For the first three years he was the assistant director, and was promoted to the associate director during his last year. He designed, launched, and coordinated the SERVE LLC. Among his honors, Grohs received a 2015 Association of American Colleges and Universities K. Patricia Cross Future Leaders Award, a 2014 Global Perspectives Program Fellowship, a 2010 University Student Leadership Award (given to a faculty member), the 2009 College of Engineering Outstanding Master’s Student, the 2007 Resident Advisor of the Year award, a 2006 McAllister Leadership Scholarship, and the 2006 Student Engineers’ Council Nathaniel Gebreyes Service Scholarship. He was also a College of Engineering Dean’s Scholar from 2004 through 2007.

He is currently on the editorial board of the Virginia Engage Journal and a reviewer for the Journal of College and Character.

Walter Lee earned his doctorate in engineering education in 2015 from Virginia Tech. His
dissertation, funded by the National Science Foundation Graduate Research Fellowship Program, was on “Influencing the Institutional Experience: A Multi-Case Study of Engineering Student Support Centers.”

Lee’s study explored the use of co-curricular student interventions intended to support undergraduate engineering students by comprehensively examining six student support centers with varying structures. The purpose of this multi-case study, where each student support center represented a case, was to explore how student interventions, offered alongside the engineering curriculum, influence the undergraduate experience from the perspective of both administrators and current students. The study also sought to identify the consequence – whether intended or unintended – that structure and configuration has on the impact of a student support center.

From 2011 until 2015, Lee was a graduate student member of the Studies in Motivation, Identity, and Learning in Engineering (SMILE) Research Group in the Department of Engineering Education (EngE), led by Holly Matusovich, a professor in EngE and Lee’s Ph.D. adviser. Simultaneously, he also earned a master’s degree in industrial and systems engineering (ISE) under the guidance of John G. Casali, a chaired professor of ISE. He received his master’s in 2013 with a focus on human factors engineering and ergonomics.

Lee’s undergraduate degree in industrial engineering was awarded in 2010 by Clemson University. He graduated cum laude with a minor in sociology.

His name appears on two journal papers with Matusovich, and he has six peer-reviewed conference papers and proceedings.

From 2011 until 2015 he served as the director of the Student Transition Engineering Program (STEP) sponsored by Virginia Tech’s Center for the Enhancement of Engineering Diversity’s (CEED). As a program assistant for CEED, Lee was also an instructor for the Galileo learning community and he developed and facilitated the Help Me Help You group-mentoring program for Black engineering students.

In 2011, 2012, and 2013, Lee served as the new student orientation coordinator for EngE. He is a member of the American Society of Engineering Education (ASEE), and served as president of the Virginia Tech student chapter in 2013-14. He regularly serves as a peer-reviewer for the ASEE and Frontiers in Education conferences. He received the Graduate Student of the Year award in 2014 from Virginia Tech.

INDUSTRIAL AND SYSTEMS ENGINEERING

Blake Johnson spent the past two years as a postdoctoral associate in the mechanical and aerospace engineering department at Princeton University. He took this position after receiving his doctorate in chemical engineering from Drexel University in 2013, earning its Best Dissertation Award for his thesis on integrated biosensing.

While at Princeton, Johnson worked on advanced biomanufacturing technologies which included applications in tissue engineering, neuroscience, 3D electronics, and nano-bio interface. His overall research interests are highly interdisciplinary. In chemical and biological engineering, he works with bio-separations, biomaterials, and bioreactors. In mechanical engineering, he explores additive manufacturing, acoustics, and finite element modeling. In chemistry, Johnson investigates surface and bio-analytical chemistry. In biomedical engineering, he examines 3D bio-printing, neural engineering, and biosensors. In electrical engineering, Johnson focuses on bioelectronics, piezoelectric devices, and wireless biotechnology.
Applications are primarily focused in tissue engineering, drug screening, toxicology, medical diagnostics, food safety, and environmental monitoring.

Johnson’s name appears on one patent for piezoelectric-based biosensing technology. His name also appears on several additional patent applications in the areas of biosensing and 3D printing.

He is the co-author of two book chapters. One is on nanotechnology to aid chemical and biological defense and the second one concerns resonant MEMS. He has 20 journal publications, and 12 colloquium and conference proceedings.

Johnson has been involved with teaching of various different classes: Process Engineering Thermodynamics, Thermodynamics of Chemical Mixtures, Process Heat Transfer, and Mathematical Models in Chemical Engineering. He has also served as a mentor for multiple undergraduate and graduate researchers.

He is qualified to teach all courses in manufacturing, chemical, and biological engineering, and potentially new courses in advanced manufacturing, biomaterials, bio-processing, biosensors, and tissue engineering.

He is a member of the American Institute of Chemical Engineers and the American Chemical Society. He has served as a scientific reviewer for: ACS Applied Materials and Interfaces; Smart Materials and Structures; Institute of Electrical and Electronic Engineers/ American Society of Mechanical Engineers’ Transactions on Mechatronics; Journal of Micromechanics and Microengineering; Sensors; Sensors and Actuators B; Analyst.

Alejandro Salado attended the Polytechnic University of Valencia and the Polytechnic University of Catalonia in Spain where he received multiple degrees. While working full-time in engineering in industry, he simultaneously earned his integrated bachelor and master degree in electrical and electronics engineering with honors in 2007, a second master’s in electronics engineering in 2010, and a third master’s in project management in 2009.

He also received a fourth master’s degree in space systems engineering from the Technical University of Delft, The Netherlands, in 2008. His doctorate in systems engineering was awarded by Stevens Institute of Technology in 2014.

He has over 10 years of industrial experience in the space industry. Before joining Virginia Tech, he had worked as a systems engineer at OHB System AG of Germany since 2012, holding various technical leading positions. From 2008 until 2012 he was a satellite systems engineer for EADS Astrium GmbH, (now Airbus Defense and Space), also in Germany. From 2006 until 2008 he held various roles as an electronics engineer, systems engineer, and project manager for NTE-SENER S.A. of Spain.

In 2005 Salado held an electrical systems engineering internship with the European Space Agency of The Netherlands. He also interned as an electronics engineer the year before with Delta-Utec SRC, also of The Netherlands. His efforts have contributed to various manned and unmanned space systems, which have included payloads onboard the International Space Station, Earth observation payloads, scientific and navigation satellites, and satellite constellations for navigation and space weather monitoring.

Since 2013, Salado has also worked part-time at Vestfold Buskerud University, Norway, as an industry professor. He has had 12 students complete their master’s degrees on systems engineering and industrial economics under his advising. He also spent a year as a part-time adjunct professor at Spain’s Universidad Pontificia de Comillas and spontaneously lectured during three years (2008-
2010) at the Polytechnic University of Valencia, Spain. Salado has authored one chapter on communication and leadership in the book Integral Project Management, published in 2013. He is a leading author of three journal articles, and has another 10 under review.


In 2015 he received the Best Academic Paper Award at the Conference on Systems Engineering Research. In 2014 he received the best contribution award in the “Space-based observing systems” session of the 11th European Space Weather Week. That year, Stevens Institute of Technology also awarded him its Outstanding Dissertation Award in Research in Systems Engineering, Engineering Management, and Enterprise Systems, its Fabycky-Blanchard Award for Systems Engineering Research, and its Best Student Paper Award. In 2010 he received a Fulbright International Science and Technology Award to pursue post-graduate education in the U.S.

MATERIALS SCIENCE AND ENGINEERING

Carolina Tallón received her bachelor’s degree in chemical engineering in 2003 from the University of Granada, Spain. She earned her graduate degrees from the Institute of Ceramic and Glass and the Universidad Autonoma de Madrid in 2008. Her Ph.D. was in inorganic chemistry and her research topic focused on synthesis of ceramic nanoparticles and colloidal processing.

Upon obtaining her doctorate, Tallón joined the University of Melbourne’s Department of Chemical and Biomolecular Engineering as a research fellow in George V. Franks’ group. Since then she has been contributing to the research and teaching in the School of Engineering, and she has been lecturer (teaching and research) in the Department of Chemical and Biomolecular Engineering of the University of Melbourne. In 2015, she became the academic convenor of the Hallmark Materials Research Initiative at the University of Melbourne.

Her current areas of interest are: ceramic materials; colloidal processing; rheology of suspensions; multi-scale porous materials; near-net-shaping techniques; porous ceramic materials; ultra high temperature ceramics; materials properties modeling; non-oxide ceramic cathodes for electrochemical applications; nanocomposites; synthesis if nanoparticles; development of inks for solar cell applications; and bioscaffolds. She is a key member of the Defense Materials Technology Centre (DMTC) and most of her research has
been focused on advanced defense applications.

She is the co-author of 17 refereed international journal articles. She is the co-author of one book chapter on near-net-shaping of ultra high temperature ceramics in Ultra-High Temperature Ceramics: Materials for Extreme Environment Applications, published in 2014. She has participated and contributed to more than 40 academic and technical conferences, including 6 peer-review proceedings.


She is part of the research group who won the prestigious Land Defense Australia National Industry Innovation Award in 2014 for their work on boron carbide armor. She earned a Best Presentation Award at the Third Defense Materials Technology Center Technical Conference, Melbourne, Australia in 2012 and she was also one of the 12 Australian Fresh Scientists in 2012.

Tallón served as a scientific committee member on the “Innovative Processing and Synthesis” Theme for the 14th International Conference of the European Ceramic Society meeting in 2015. She was the conference organizer co-chair of the conference “Ultra-High Temperature Ceramics: Materials for Extreme Environment Applications III” in Australia in 2015. She also co-chaired the “Rheology and Suspension Stability” Theme at the Seventh Biennial Australian Colloid and Interface Symposium in 2015.

She has been teaching for the last six years, across several departments at the School of Engineering of the University of Melbourne, including: chemical and biomolecular engineering, mechanical engineering, infrastructure engineering, and electrical engineering.

Hang Yu started his academic career with an appointment as a research assistant at the Massachusetts Institute of Technology’s (MIT) Department of Materials Science and Engineering (MSE). He joined Carl V. Thompson’s group in September of 2007. He was promoted in February of 2013 to postdoctoral associate with Thompson.

Since March of 2014 Yu has worked as a postdoctoral associate with Christopher Schuh, chaired professor and MSE department head at MIT.

Yu has focused on three specific areas: materials design in additive manufacturing; design and manufacturing of smart materials including shape memory alloys and shape memory ceramics; and the origin and control of residual stresses in manufacturing of metallic materials.

Among his accomplishments, he developed a scheme for materials optimization in multi-materials additive manufacturing. Yu discovered stress-induced texture formation and martensitic transformation in granular shape memory ceramics, based on which he developed a process to enable ultra-high energy dissipation in granular shape memory ceramics for vibration damping applications.

Yu discovered two key mechanisms for residual stress evolution during vapor phase deposition, and developed stress evolution maps with which the residual stress level in metal coatings can be precisely controlled in ‘homologous temperature-deposition rate’ space and ‘homologous temperature-incidence angle’ space.

He is the first author of six refereed journal publications, and has a few more in preparation. He has been a speaker for a number of invited seminar talks, including a 2014 Harvard materials science seminar and a 2013 research seminar at Karlsruhe Institute of Technology.

Regarding teaching experience, he has worked as an instructor
on bulk materials processing at MIT, as well as a teaching assistant for two semesters during the fall of 2010 and 2011.

Among his awards, Yu was named a Chun-Tsung Scholar, named after the Nobel Laureate T.D. Lee. In 2007, he graduated in physics from Peking University, Beijing, China, with its highest graduation honors.


Yu earned his doctorate in MSE at MIT in 2013.

MECHANICAL ENGINEERING

Since receiving his doctorate in electrical engineering from Stanford University in 2010, Alan T. Asbeck was a postdoctoral researcher at his alma mater for two additional years, and then went to Harvard University in June of 2012, first as a postdoctoral research fellow and later as a research scientist.

Asbeck worked as part of Harvard University’s Wyss Institute for Biologically Inspired Engineering in the Bionics Lab with Conor Walsh. This lab focuses on applying disruptive technologies to the development of robotic devices for augmenting and restoring human performance.

Asbeck’s research goal is to create wearable robotic devices that will help people move. At Harvard, Asbeck’s role was to act as the lead designer of several textile-based exosuit systems that assist a wearer during walking, to perform biomechanical analysis to determine suit architectures and their actuation strategy, to model the suit-human interaction, and to develop control algorithms to synchronize the exosuits with the wearer’s motions.

He also collaborated on a proposal for DARPA’s Task B Warrior Web program. The proposal plus the progress made on the Task A grant resulted in a $2.9 million award for continued development.

At Stanford, Asbeck worked in the artificial intelligence laboratory with Andrew Ng. Asbeck was the lead mechanical designer of a low-cost, series elastic humanoid robotic arm.

When Asbeck was obtaining his doctorate, he worked in the Biomimetics and Dexterous Manipulation Laboratory with Mark Cutkosky. He was the primary inventor and developer of a microspine technology for adhesion to rough surfaces. He applied technology to climbing robots, human climbing, and airplane perching. He also conducted robot prototyping, designing Spinybot I and II.

Prior to arriving at Stanford, Asbeck worked on his master’s degree at the Massachusetts Institute of Technology. He was a research assistant with Louis Braida’s sensory communication group, conducting research on the simulation of hearing loss via digital signal processing of audio files. He earned his master’s in 2003, the same year he also received one of his two bachelor’s degrees from MIT. The second one was in physics, and his first MIT bachelor’s degree is in electrical engineering, received in 2002.

His name appears on eight journal papers. He is a co-author of two book chapters in robotics study. One is on a case study of soft exosuits for walking assistance and the second is on scansorial landing and perching. He co-holds two patents in robotic technology and has several others pending.
Among his honors, he received a 2002 National Science Foundation Graduate Research Fellowship. He is a reviewer for the Institute of Electrical and Electronic Engineers’ (IEEE) Transactions on Mechatronics, IEEE Transactions on Robotics, and the IEEE Robotics and Automation Magazine. He was a judge at the 2014 National American Society of Mechanical Engineers Student Robotics Design Competition.

Pinhas Ben-Tzvi was the director of George Washington University’s Robotics and Mechatronics Laboratory (RML) in the Department of Mechanical and Aerospace Engineering. He founded this lab when he joined the GWU faculty in 2008.

His research focuses on field robotics, specifically the kinematics, dynamics, design, control, and implementation of autonomous dexterous manipulation and locomotion systems. This research includes investigations of upper-extremity wearable exoskeleton robotic mechanisms for tele-operation. He has used this technology to expand his research into rehabilitation therapy.

He concentrates on designing novel robot architectures and control algorithms that can serve as technological enablers for challenging field robotics and rehabilitation therapy tasks. Some examples of the novel robot architectures include hybrid locomotion-manipulation and modular-reconfigurable mobile robots, biomimetic flexible snake-like robots, and under-actuated exoskeletons.

He has taught a wide variety of undergraduate and graduate level courses in his field of expertise. He also initiated the development of a new undergraduate robotics option at GWU, as well as a half a dozen new courses. For the past five years, he has mentored and coached a First Robotics Competition Program at a local high school in Washington, D.C. Since 2011 he has offered a robotics workshop for Loudon County, Virginia high school students as part of GWU’s Science, Technology, and Engineering Day at the Virginia Science and Technology Campus.

Prior to his tenure at GWU, Ben-Tzvi spent two years as a lecturer at the University of Toronto’s Department of Mechanical and Industrial Engineering. From 2006 until 2008 he was a consultant at the Mobile Robots Division of Engineering Services, Inc., Toronto, Canada. He was responsible for the design, analysis, development, and integration of mobile robot systems.

Among his awards, he received the 2013 International Journal of Control, Automation, and Systems Academic Activity Award in recognition of his outstanding service and dedicated work as an editorial board member and for his contributions in the development of the journal. He also received the 2013 GWU School of Engineering and Applied Science’s Outstanding Young Researcher Award for his contributions to robotics, mechatronics, mechanism design and integration, system dynamics and control, and sensing and actuation. That same year he also received the Outstanding Young Teacher Award.

Ben-Tzvi won a Best Paper Award at the 2011 COMSOL Conference for his co-authorship of the paper “MEMS-Based Microdroplet Generation with Integrated Sensing.”

He has 70 peer reviewed journal publications and peer-reviewed papers in conference proceedings. He is the co-author of a book chapter on a mechatronic perspective on robotic arms and end-effectors in Intelligent Mechatronics, an open access book that has been downloaded more than 6000 times as of the end of 2014. His holds three U.S. patents regarding robotics technologies and another four that are pending.

Ben-Tzvi received his bachelor’s degree, summa cum laude, in
mechanical engineering (ME) in 2000 from the Technion-Israel Institute of Technology. He earned his master’s and doctoral degrees in ME in 2004 and in 2008, respectively. Prior to studying at the undergraduate level, Ben-Tzvi was a first sergeant in the Israeli Air Force Academy from 1993 until 1996. There he was a senior instructor of engineering courses. From 2000 until 2002, he was a research and development ME at General Electric Medical Systems, Haifa, Israel.

Jiangtao Cheng started his professional academic career in 2002 as a postdoctoral research associate at Texas A&M University. After two years, he moved to the University of California at Irvine as a postgraduate researcher. In 2006 he joined the Pennsylvania State University as a research associate. In 2007 he accepted an offer from the Teledyne Scientific Company (formerly Rockwell Science Center) as a research scientist III for the next four years. He returned to academia in 2011 as an associate professor at the University of North Texas.

His areas of expertise include: sustainable energy and renewable energy; optofluidics and electrofluidics; microfluidics and nanofluidics; thermal-fluid science and heat transfer; thermal management and microelectronics cooling. Recently Cheng introduced surface plasmon resonance and terahertz technology to his research in thermal-fluid science.

Among his honors, Cheng received the Best Paper Award at the 2014 International Conference on Heat Transfer, Fluid Mechanics, and Thermodynamics. He earned the Best Fair Awards at both the 2014 and 2015 Fort Worth Regional Science and Engineering Fair. In 2013 Cheng won the Outstanding Overseas Young Scholars Award from the National Natural Science Foundation of China. In 2003 he won the Outstanding Paper Award at the fall meeting of the American Geophysical Union, and in 1997 the China Ministry of the Nuclear Industry presented him with its Science and Technology Advancement Award.

Cheng has served as the principal investigator of several research projects funded by the Department of Energy, NASA, the Defense Advanced Research Program Agency and the National Science Foundation respectively with a total funding exceeding $3.2 million. In 2010 he led a project on optofluidic solar concentrators that received high acclaim from the U.S. Department of Energy. It pronounced that his work was "one of six transformational energy research and development projects that could revolutionize how the country uses, stores, and produces energy."

Cheng is the co-holder of one patent on solar energy concentrator architectures. He has two patents pending: one for a self-tracking heliostat for solar energy harvesting with the U.S. Patent Office and one for electrowetting-controlled liquid lenses for solar self-tracking with the China Patent Office.

He has served as a reviewer for 18 international journals, including Physical Review Letters, Physical Review E, Microfluidics and Nanofluidics, American Chemical Society’s Applied Materials and Interfaces, International Journal of Heat and Mass Transfer, Energy Conversion and Management, and Inverse Problems.

He was a session chair for the 2012 American Society of Mechanical Engineers’ (ASME) Third Micro/Nanoscale and Mass Transfer International Conference, a session chair and technical program committee member for the ASME 2013 Fourth Micro/Nanoscale Heat and Mass Transfer International Meeting, and a member of the technical committee of the Tenth International Conference on Heat Transfer, Fluid Mechanics, and Thermodynamics in 2014.

He has co-authored 27 peer reviewed journal articles, five of
which are in preparation or recently submitted. Cheng received his bachelor’s degree in applied physics from Peking University in 1991. From Purdue University, he earned his master’s degree in computer science in 2002 and his doctorate in physics, also in 2002.

For the past five years Weiwei Deng was an assistant professor at the University of Central Florida’s Department of Mechanical and Aerospace Engineering. His research interests are in fluid dynamics of low-dimensional liquid subjects, such as droplets, jets, and films, and their applications in additive manufacturing. His current National Science Foundation sponsored projects include printing ceramic sensors for harsh environments and nano-manufacturing of polymer solar cells via an electrospray deposition. His industry sponsored research includes spray drying routes for biodegradable micro/nano particles for drug delivery, as well as processing complex liquid suspension for manufacturing lithium ion batteries.

He has obtained over $1.46 million in total funding, all as principal investigator, with a personal share of $1.06 million. He is the recipient of a NSF CAREER award “Scalable Electrospray Processing of High-Efficiency Perovskite Solar Cells” starting August 2015.

Prior to joining Central Florida, Deng was a post-doctoral associate at Yale University from 2008 until 2010. His doctorate was awarded by Yale in 2008 in mechanical engineering, and he spent a year also working as a lecturer for this department. He taught five different graduate level classes as well as undergraduate courses in fluid mechanics and in heat transfer. He developed one of these graduate courses, Direct Energy Conversion, with an emphasis on solar energy.

He is currently supervising three Ph.D. candidates and one master’s student. He has already graduated three master’s students, one Ph.D., and advised one post-doctoral researcher and one undergraduate.

Deng served as the faculty adviser of an award winning student entrepreneurial team. The team won the Southeast Region of the National Clean Energy Business Plan Competition, securing $100,000 and a trip to the White House. One of the students subsequently founded a start-up company to commercialize the technology.


He is a co-applicant on three patents, two pertaining to electrospray techniques and the third on a method and apparatus for mono-dispersed liquid droplet generation.

Deng has served on three National Science Foundation panels as a reviewer. He has reviewed manuscripts for Microfluidics and Nanofluidics, Journal of Aerosol Science, Aerosol Science and Technology, Applied Physics Letters, and Organic Electronics.

Deng has played coordinating roles at the American Association of Aerosol Research annual conferences. He was a session chair for the aerosol physics portion of the meetings in 2011 and in 2012. He chaired the aerosol physics working group at the 2009 meeting. The year he received his doctorate he was the convener and chair of the meeting’s special symposium on the applications of the electrospray.

His bachelor and master’s degrees in engineering mechanics were received at Tsinghua University in 1999 and in 2001, respectively.
Azim Eskandarian, previously a professor of engineering and applied science and the director of The George Washington University’s (GWU) Center for Intelligent Systems Research and its National Crash Analysis Center, has assumed the department head position of mechanical engineering at Virginia Tech.

He is leading the university’s highest ranked department in a 2015 survey of more than 3,500 universities by the QS World University Rankings, a resource for prospective students worldwide.

Eskandarian has spent most of his career in the academic world. He earned his bachelor and doctoral mechanical engineering (ME) degrees from GWU in 1982 and in 1991, respectively. He received his master’s degree, also in ME, from Virginia Tech in 1983.

While at GWU, Eskandarian played an instrumental role in the establishment of a unique graduate program of study in automotive safety and intelligent transportation systems. He also founded the Center for Intelligent Systems Research in 1996 and held the position of its director for 19 years. He co-founded the National Crash Analysis Center in 1992 and became its director from 1998 to 2003 and again in 2013. In 2003 he founded and became director of GWU’s Area of Excellence in Transportation Safety and Security. He established a passenger car and a truck driving simulator, and a mobile robotics laboratory, among other research laboratories, some of which were also utilized in course instructions.

His areas of research specialty include: dynamic systems and controls; intelligent systems; multi-body and impact dynamics; applied mechanics and nano-mechanics; and non-linear dynamic finite element modeling and meshless methods, with applications in automotive safety, autonomous and intelligent vehicles, and robotics. Recently, he has conducted research in brain-computer-interface (BCI) for the driver brain and cognitive monitoring and other control applications.

His sponsored research exceeds $27 million, with $11.5 million as the principal investigator and the remaining as a co-principal or a key investigator. He has directed or co-directed 12 post doctorates, advised or co-advised to completion 18 doctoral candidates and another 18 master’s students. He has worked with 36 unique student projects. Eight of his students hold faculty positions worldwide. He has published 147 refereed articles, three edited volumes, one book, and one reference handbook, and holds a U.S. patent. Two of his publications in the Institute of Electrical and Electronic Engineers’ (IEEE) Transactions on Intelligent Transportation Systems were among the top 10 highest cited articles during the 10 year period 2000-2009. Another co-authored article with a student won a Student Paper Award in a session of the American Society of Mechanical Engineers’ (ASME) IMECE 2012 conference. He won the GWU School of Engineering and Applied Science Distinguished Researcher Award in 2011.

He is an associate editor and a board member of five journals, including the ASME Journal of Dynamic Systems, Measurement, and Control, Institute of Mechanical Engineers (IMechE) Journal of Multi-body Dynamics, and IEEE Transactions on Intelligent Transportation Systems. He served twice as a member of the governing board of the IEEE Intelligent Transportation Systems Society. He served as an expert consultant to industry and government on various projects and provided expert opinions on intellectual property (patents) matters. He also served as an invited member on several technical/professional committees and review panels for DOT/NHTSA, NSF, NAS, TRB, and Canadian Centers of Excellence, Canada Foundation for Innovation, and various European funding agencies.

He is a Fellow of ASME, a senior member of IEEE, and a member
of Society of Automotive Engineers, and Tau Beta Pi and Pi Tau Sigma Engineering Honor societies.

Prior to joining GWU in 1993, he was an assistant professor of ME at Penn State University, York campus, and earlier worked as an engineer and project manager with industry from 1983 until 1989.

For the past four years Xiaoyu “Rayne” Zheng has worked at the Lawrence Livermore National Laboratory (LLNL), Livermore, California. He started in 2011 as a postdoctoral research staff member working on additive manufacturing initiatives and micro-architected materials, and in two years was promoted to staff engineer/scientist leading projects in additive manufacturing and hierarchical architectural materials as a principle investigator.

At Livermore he developed over a $1 million supported research program on additive manufacturing and hierarchical micro-architected material development from the Department of Defense (DOE) Laboratory Directed Research and Development Office (LDRD) and Defense Advanced Research Program Agency (DARPA).

The aim of Zheng’s research is to advance the next generation of additive manufacturing processes and design tools to enable the design, analysis, and fabrication of multi-scale, three-dimensional materials and systems that possess extraordinary and unique capabilities for structural, energy, biological and environmental applications. He invented a scalable additive manufacturing entitled emulsion based projection stereolithography for arbitrary, three-dimensional, multi-material manufacturing of polymer, metals, ceramic and nanoscale materials such as graphene, nanowires, and nanotubes.

In 2014, Zheng led the LLNL and MIT team and developed the “Ultralight, Ultrastiff Metamaterials” in polymer, metal and ceramic. These materials are as light as aerogel but with 10,000 more stiffness. He published his results as the lead and corresponding author on the June 20, 2014 issue of Science and his article was featured in the Highlight section of that issue. His work has been widely reported in news articles including MIT Technology Review, Science Daily, ABC News, Materials Today, MRS Bulletin, and American Institute of Physics. His current research activity on low density hierarchical materials was also featured on the June 2015 issue of Science and Technology Review.

Among his awards, he received the 2013 LLNL Directorate Publication Excellence Award, the 2012 Material Research Society (MRS) Best Poster Award, Boston University Best Dissertation Award in 2011, and the 2010 Institute of Electrical and Electronic Engineers (IEEE) Sensor Conference Best Paper Award. For teaching, he received the 2008 Boston University Outstanding Teaching Award. In 2007 he won the President’s Prize, the top honor for graduate students given at the Boston University Research Symposium.

He has 14 journal publications. He is a co-author of a book chapter on micro/nanostructures for measuring cellular forces in cardiac myocytes in Nanomanufacturing, published in 2009. His dissertation on the microsystem based opto-mechanical platform for cardiovascular cell contraction study received Boston University’s College of Engineering Best Dissertation Award in 2011.

He earned a dual bachelor’s degree in mechanical engineering (ME) and in applied mathematics in 2005 from the Beijing University of Aeronautics and Astronautics, Beijing, China. He started work immediately on his doctorate at Boston University and received his Ph.D. in ME in 2011.

He is a member of MRS, American Society of Mechanical Engineers, IEEE, and the Biomedical Engineering Society. He is a referee for these peer-reviewed journals: Applied Physics Letters,
MINING AND MINERALS ENGINEERING

Cheng Chen spent the past three years as a reservoir engineer and project leader of geomechanics in the production enhancement group for Halliburton of Houston, Texas. His work included: leading the development of the Graphics Processing Unit (GPU) - Accelerated Lattice Boltzmann Simulator (GALBS) for Halliburton’s Digital Rock Laboratory, which runs on single personal computers at a significantly accelerated speed based on GPU parallel computing using OpenCL and CUDA; leading the development of a core library to collect the geomechanical and petrophysical properties of core samples extracted from both conventional and unconventional reservoirs; and developing the modified ANNIE model to study the anisotropic elastic moduli of reservoir rocks using static and dynamic geomechanical data.

In general, his research interests are: rock characterization using computed tomography and scanning electron microscope imaging; use of the Lattice Boltzmann method; multi-scale simulation of flow and transport in porous media; and shale oil and gas.

Prior to his employment at Halliburton, Chen was a postdoctoral fellow at the Center for Petroleum and Geosystems Engineering at the University of Texas at Austin from June until November of 2012. In this capacity he conducted reservoir simulation of enhanced shale oil recovery by carbon dioxide flooding in the Bakken formation using an equation of state based compositional model. He also worked on multi-scale simulation of enhanced shale oil recovery.

From August of 2010 until June of 2012 he was a visiting professor at the Institute of Soil and Water Resources and Environmental Science at Zhejiang University of Hangzhou, China. He held another position as a postdoctoral research associate at the University of Southern California at Los Angeles’ Department of Civil and Environmental Engineering from August of 2008 until December of 2009.

From September of 2003 until June of 2008 Chen was a research assistant at Northwestern University’s Department of Civil and Environmental Engineering.

His teaching transcended his positions with stints as a lecturer for Halliburton on fluid mechanics and for the International Sino-Energy Alliance on unconventional energy resources. At Northwestern he lectured at both the undergraduate and graduate level classes.

Among his honors, Chen received the 2008 Consortium of Universities for the Advancement of Hydrologic Science Supported Fellow Award. He also won the 2006 Outstanding Student Paper Award at the American Geophysical Union fall meeting.

He is the co-author of one book chapter on interactions between sediments and water. He has authored or coauthored 17 peer-reviewed journal papers and more than 20 conference papers. His name appears on two patent applications. He is a member of Sigma Xi, Society of Petroleum Engineers, American Geophysical Union, and American Society of Civil Engineers.

Chen received his bachelor’s degree in hydraulic engineering from Tsinghua University, China in 2003. He earned his master’s and doctoral degrees in civil and environmental engineering in 2005 and 2008, respectively, from Northwestern University.
Virginia Tech College of Engineering
3046 Torgersen Hall, Virginia Tech
620 Drillfield Drive,
Blacksburg VA 24061
(540) 231-6641 • www.eng.vt.edu

CREDITS

Dean: Richard C. Benson
Editor and Writer: Lynn Nystrom
Designer: David Simpkins
Assistant Editor: Lindsey Haugh

Virginia Tech does not discriminate against employees, students, or applicants on the basis of age, color, disability, gender, national origin, political affiliation, race, religion, sexual orientation, or veteran status. Anyone having questions concerning discrimination or accessibility should contact the Office for Equality and Access.