

Juan Cui is recognized for outstanding research in computational and systems biology, especially her interdisciplinary research in dietary microRNA with the Nebraska Center for the Prevention of Obesity Diseases through Dietary Molecules (NPOD). Juan is also an outstanding mentor, with one of her students receiving the CSE Outstanding Graduate Student Research Award this past spring.

THE DURHAM SCHOOL OF ARCHITECTURAL ENGINEERING AND CONSTRUCTION

George Morcouis is a structural engineer who specializes in the design of concrete bridges. He conducts impactful research in the area of design innovation with a focus on accelerated bridge construction where constructors are able to build bridge much more rapidly, saving undue congestion for the traveling public.

Ece Erdogmus is a structural engineer who specializes in design and analysis of masonry structures, including arch bridges. She also teaches the on-the-road Global Experiences in Architectural Engineering course in conjunction with the UNL's Engineering Study Abroad in Italy program. She has been selected as one of two to attend Big Ten Academic Alliance leadership programs this year.

Erica Ryherd is an acoustics engineer who specialized in building systems. She is a researcher in the interaction of humans, wellness, and acoustics in hospital environments. She was one of the initial catalysts for the healthcare design initiative.

Terry Stentz is an expert in ergonomics and human factors. He works with UNMC on joint research projects in the area of healthcare ergonomics and processes, most recently with the emboli transport project. He is a 28-year Navy vet with service in many theatres dating back to Viet Nam.

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Michael Hoffman is recognized for groundbreaking contributions to advanced signal processing techniques implemented into an ultra low-power sensor for detection of nuclear material.

Yi Qian is recognized for contributions to communications systems, computer and network security, and cyber security.

Chris Argyropoulos is recognized for contributions to understanding of the metasurfaces and nanoantennas that provide an exclusive route towards the manipulation, confinement, and enhancement of radiation at the nanoscale.

Hamid Sharif is recognized for contributions in advanced communications systems in rail transportation.

Mathias Schubert is recognized for contributions to new electronic and photonic materials.

DEPARTMENT OF MECHANICAL AND MATERIALS ENGINEERING

Ali Tamayol works at the intersection of biomedical engineering, materials, and micro/nanotechnologies to enhance quality of life. His advancements in tissue engineering has led to improved wound healing and technologies that resist tissue diseases. He is the PI of two new NIH R01 awards. He came to MME in 2017 from Brigham and Women's Hospital and Harvard Medical School.

Jian Wang's work is focused on understanding and controlling the deformation mechanisms in hexagonal materials such as titanium and magnesium--important materials for lightweight applications. He combines modeling and experiment to examine atomic-level motion of atoms. He is funded by the DOE and NSF. Jian joined MME from Los Alamos National Laboratory.

Prahalada Rao is a data scientist with a focus on additive manufacturing and 3D printing. He is working to develop techniques to qualify parts as they are being built - the primary challenge facing the AM community - using sensors and machine learning. He is the recipient of an NSF CAREER Award and several other NSF grants. He joined MME from SUNY-Binghamton.

Bai Cui works on developing materials for use in extreme environments, ensuring function at high temperatures and under irradiation conditions. Developing these materials is critical for use in next-generation nuclear reactors. Bai uniquely is an expert in both metals and ceramics, and conducts many in situ electron microscopy experiments to understand the behavior of materials in different conditions. He has received funding from industry, NSF, and NRC, among others.

Carl Nelson's research is dedicated to projects blending mechanical design, robotics, medicine, rehabilitation, and assorted other topics with societal relevance. He has developed a number of medical technologies, including surgical instruments and rehabilitative machines. He has received funding from a variety of sources.

Joe Turner focuses, in part, on using ultrasonic techniques to characterize the microstructure of materials at the granular level. This is advancing the state-of-the-art in non- destructive evaluation and impacts a wide variety of fields, including railroad, biomedical, and aerospace industries. He also is researching pathways to understand living polymer systems. He has been funded by industry, NSF, and other agencies.

UNIVERSITY OF NEBRASKA - LINCOLN
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RESEARCH CELEBRATION

NOVEMBER 1, 2018



COLLEGE OF ENGINEERING RESEARCH CELEBRATION

2018 HONOREES

DEPARTMENT OF BIOLOGICAL SYSTEMS ENGINEERING

Troy Gilmore is an assistant professor in the Biological Systems Engineering Department and the School of Natural Resources. His research intends to characterize interactions between groundwater and surface water resources that is relevant to the understanding and management of water as a single resource, with a focus on landscapes and agricultural systems. His work engages stakeholders in western Nebraska by conducting research on groundwater availability including groundwater recharge rates, quality and groundwater-surface water interaction, and groundwater aging. He has been successful at leading groups to secure federal funding and is publishing in significant journals.

Aaron Mittelstet focuses on environmental engineering and hydrology. He has made significant contributions in streambanks restoration, water quality assessment, and groundwater monitoring. He is contributing to a better understanding of groundwater behavior and water quality in Northeast Nebraska. He has successfully secured significant external research funding from local and federal sources. His research is informing producers and policy makers about the long-term impact of practices and regulations.

Francisco Munoz-Arriola focuses on hydroinformatics and intends to improve water resources development and management for food production to produce a lasting and significant impact on achieving more food security with less pressure on scarce water resources. He is attempting to accomplish this by developing and evaluating sustainable management water resources, applying modeling and information systems to address societal and environmental water needs in areas where water development is dominated by the demands of agricultural production systems. He is involved with a significant NSF-funded training grant at UNL and has established collaborations around the world.

Daran Rudnick is stationed at the West Central Research and Extension Center in North Platte. He works in the field of irrigation engineering. His work is being recognized around the world for his innovation and discoveries in water management and site-specific water application, and building multi-disciplinary teams. He is a key contributor in the National Irrigation Consortium, been involved in numerous publications, and has contributed to over \$7 million in external funding. In addition to his impact on the irrigation and water management practices in Nebraska and beyond, he is changing the way producers are viewing water and their water resources.

Becky Wachs focuses on addressing critical gaps in musculoskeletal pain, specifically low back pain. Her approach leverages her background in biomaterials, orthopedics, and neural engineering to create novel materials and drug delivery systems to treat low back pain. One major thrust of her work is aimed at developing tissue engineering solutions to regenerate the intervertebral disc thereby alleviating low back pain. For this work, she is utilizing techniques and patents she developed as part of postdoctoral work at the University of Florida that she is continuing at UNL. Her approach utilizes decellularized pig tissue in combination with stem cells to reduce the inflammatory response and regenerate a healthy disc.

DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING

Wei Niu is recognized for her research on expanding the substrate specificity of carboxylic acid reductases (CARs) by directed evolution in order to efficiently reduce short-chain carboxylic acid metabolites into aldehydes. These aldehydes serve as common and versatile biosynthetic intermediates for the production of industrially and pharmaceutically important chemicals. Recently, Wei received a three-year grant from the National Science Foundation to support her research in biocatalytic reduction of carboxylic acids.

Vitaly Alexandrov is recognized for his research on a catalyst-based technique that can double the amount of carbon dioxide conversion to ethylene, an essential component of the world's most common plastic, polyethylene. His research in this area has received support from the Engineering and Physical Sciences Research Council and the Welsh Government Sêr Cymru Program.

Shudipto Dishari is recognized for her research on the synthesis and development of polymers and polymer-based nanomaterials. She explores how the polymers behave in nanoscale materials and how those properties can be optimized for renewable energy and biomedical applications. Shudipto recently received an NSF CAREER Award (2018-2023) to pursue research on innovative polymer design and understanding of ionomer-catalyst interface.

Rajib Saha is recognized for his research to understand how plants produce their own means of defending themselves against pathogens, predators and the environment to develop more vigorous food crops. Rajib is among a group of researchers working on this research, which is supported by a three-year National Science Foundation grant.

Siamak Nejati is recognized for his research on developing a hybrid mathematical and experimental approach to address the challenge of low flux of hollow fiber membrane distillation module using a first-principles mathematical model to design and configure the membrane module and to conduct system level simulations of stand-alone solar-driven membrane distillation. Siamak was recently awarded a grant from the U.S. Department of Interior for support of this research.

Chris Cornelius is recognized for his research investigating the fundamental material interrelationships between structure, physical properties, and transport, of natural and synthetic polymers, ionomers, hybrid organic-inorganic materials, and sol-gel glasses. His combined research experience spans over 15 years as a faculty member, a senior administrator in academia, a national laboratory staff scientist, and an industrial engineer. He uses his unique perspectives to contribute to outreach efforts to promote student and faculty diversity to enrich the research, scholarship, and learning domains. He is also the editor of the Journal of Materials Science.

DEPARTMENT OF CIVIL ENGINEERING

Bruce Dvorak is an environmental engineer and focuses his research on applied methods for improving the sustainability of industrial operations and small municipal drinking water and wastewater systems. He is the PI or co-PI on seven active external grants with a total value of \$2.4 million. His current funding is from the U.S. Environmental Protection Agency, U.S. Department of Energy, and the Nebraska Department of Environmental Quality. He is outreach director of the Water Innovation Network for Sustainable Small Systems (WINSSS) Center, a Small Systems Innovation Center funded by the U.S. Environmental Protection Agency. He also serves as associate director of the Nebraska Industrial Assessment Center.

Shannon Bartelt-Hunt conducts research on water quality and health and engagement of Nebraskans through citizen science.

Ron Faller is internationally recognized as a subject expert in roadside safety hardware design and evaluation. He has acquired nine patents for roadside safety designs, 10 best paper awards at the Transportation Research Board annual meeting, organized and chaired the First International Roadside Safety Conference and Peer Exchange, led the group that developed the Midwest Guardrail System (MGS) - the new guardrail standard across the U.S., and is part of the group that developed the SAFER barrier for high-speed racetrack applications, used on many high-speed racetracks in the U.S.

Laurence Rilett is a Distinguished Professor of Civil Engineering and his field of research is in the transportation system analysis area. He is currently PI on seven projects and co-PI on two projects with a total funding of approximately \$16.3 million. Since arriving at UNL in 2004 he has been a principal investigator or co-principal investigator on over 40 research projects with total funding in excess of \$45 million. His research sponsors have included the U.S.D.O.T., the National Science Foundation, the Texas Department of Transportation, the Nebraska Department of Roads, the U.S. Environmental Protection Agency, the US Department of Defense Transportation Command (TRANSCOM), and the Federal Railway Administration.

Yong-Rak Kim is a leading scholar in his field to advance the understanding and development of various infrastructure materials to enable more sustainable, functional, and future-oriented civil structures. Toward the challenge, Kim's research is multidisciplinary with a close collaboration with different engineering-science fields including mechanics, materials science, chemistry, and physics. In 2018, he has been involved in 17 projects (12 as a PI) funded from diverse agencies (federal/international/state/internal). In 2018, his creative research activities have resulted in 12 high-impact journal papers and 14 national/international presentations including the two best paper/poster awards. His research program in 2018 has been very prolific with nine Ph.D. students, three visiting scholars, and six undergraduate research assistants for a number of research projects and joint publications-presentations. He has leadership roles in several technical committees and professional societies and serves an associate editor for four journals and an Editorial Board Member of three other journals.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Qiben Yan is recognized for outstanding research in Internet-of-Things security, as demonstrated by his recent NSF award for Ultrasonic-RF radio for smart home communication and for his interdisciplinary research demonstrating "High-Bandwidth Ultrasonic Communication Using Graphene-based Radio", which received the Best Demo Award in IEEE INFOCOM 2018. Qiben was also awarded the CSE Student Choice Outstanding Teaching Award - Graduate Level this past spring.

Hongfeng Yu is recognized for outstanding research on big data analysis and visualization, his NSF CAREER Award, and interdisciplinary research.

Leen-Kiat Soh is recognized for outstanding research in multiagent systems, especially in their application to education, as evidenced by his recent \$2M NSF award entitled "Adapt, Implement, & Research at Nebraska." Leen-Kiat has also been recognized as a Teaching Academy Fellow for his outstanding teaching.

Mehmet Can Vuran is recognized for outstanding research and impact on his discipline, with Thomson Reuters naming him among the top one percent of researchers for most cited documents in Computer Science three years in a row.

Carrick Detweiler is recognized for outstanding research and economic development. He co-directs and co-founded the Nebraska Intelligent MoBile Unmanned Systems (NIMBUS) Lab and also co-founded the company Drone Amplified, which sells drone-based fire ignition systems. His research focuses on improving the robustness and safety of aerial robots and sensor systems operating in the wild.

Brian Bockelman is recognized for outstanding research in high-performance computing. He heads up a division of the Open Science Grid that assembles its software to best serve the needs of the physicists, biologists, chemists and other scientists who regularly use it. His impact is such that he has made contributions to two Nobel-level scientific results in recent years.