



UCF

UNIVERSITY OF CENTRAL FLORIDA | ORLANDO

College of Engineering and Computer Science
FACULTY RESEARCH TALKS

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Zoom talk | Friday, Sept. 25, 2020 | Noon to 1 p.m.



PRESENTER 1:
NI-BIN CHANG
Professor,
Civil, Environmental
and Construction
Engineering

Synergizing Technology Innovation and Integration in an Urban Food-Energy-Water Nexus Under Global Change Impact

Many cities across the globe are facing difficult challenges managing their food, water and energy systems. Food, water and energy sectors are tightly interconnected and interdependent one another, not only locally but also regionally. This is known as the food-energy-water (FEW) nexus. Innovative technology solutions are particularly important to enable cities to better manage their infrastructure systems, adapt to climate change and understand the benefits and tradeoffs from different solutions. This presentation will discuss how emerging and existing technology hubs can be synergized, integrated and optimized through cost-benefit-risk tradeoffs in an FEW nexus to fill in the gaps of sustainable development.

Dr. Chang received his Ph.D. in environmental systems engineering from Cornell University. His primary research areas are sustainable technology invention, integration and process optimization with the aid of planning, monitoring, modeling and laboratory analyses. He has published more than 275 journal articles, received 12 U.S. patents and has authored/co-authored nine books. Dr. Chang is a fellow of seven professional organizations, including the National Academy of Inventors and the Royal Society of Chemistry. He received the Blaise Pascal Medal in 2016 and has served as editor-in-chief of the *SPIE Journal of Applied Remote Sensing* since 2014.



PRESENTER 2:
QIPENG ZHENG
Associate Professor,
Industrial Engineering
and Management
Systems

Applied Operations Research Lab (AORL)

Technology advancement, population explosion and life-standard improvements have helped humankind make a big leap forward. However, there is a catch: the grand challenge to do more with less. Fortunately, the various systems (e.g., water, food, healthcare, energy, transportation, communication) that serve us daily are woven together. The AORL team applies various operations research tools to explore the synergies among these systems and stand up against this grand challenge, if not conquering it.

Dr. Zheng joined UCF in 2013. He is the director of AORL, and editor-in-chief of *Energy Systems*. He received his Ph.D. from the University of Florida. An expert in the field of operations research, he has worked specifically in network optimization, stochastic optimization, integer programming and applied game theory, with applications in a variety of areas such as energy systems, transportation planning, healthcare systems, production planning, sustainability, supply chain management, food-energy-water nexus, artificial intelligence and applications (e.g., social media, marketing, geotechnology), and blockchain implementations, among many others.

ZOOM LINK: <https://bit.ly/35unuVe> | **QUESTIONS?** Email Jennifer.Sutton@ucf.edu

For more information, and to see previous talks, visit www.cecs.ucf.edu/faculty-research-talks

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PRESENTER 3:
YEONWOONG JUNG

Assistant Professor,
Materials Science
and Engineering,
NanoScience
Technology Center

Opportunities of Near-Atom Thickness Two-Dimensional Materials for Emerging Transformative Technologies

In this presentation, Dr. Jung will introduce his research on emerging nanoscale materials and their translation to transformative technologies through interdisciplinary approaches. His primary focus is on exploring near atom-thickness two-dimensional (2D) semiconducting and metallic materials beyond graphene. His lab conducts every aspect of 2D materials research, including new synthetic methods development, atomic-scale characterization and novel applications in electronics, opto-electronics, environmental and energy fields such as stretchable device technologies.

Dr. Jung received his B.S. from Seoul National University, his M.S. from the University Illinois Urbana Champaign and his Ph.D. from the University of Pennsylvania, all in materials science and engineering. He joined UCF in 2016 after completing his post-doctoral training at Yale University. He has authored more than 80 papers, including 50 papers at UCF, receiving a career citation number of over 5300. Many of these works were published in high-impact journals including *Nature's* sister publications and *Science*. His research at UCF has been supported by several federal agencies including the NSF, EPA and AFRL, as well as foreign agencies such as the National Research Foundation of Korea.



PRESENTER 4:
LIQIANG WANG

Associate Professor,
Computer Science

Employing Deep-Learning Techniques in the Fields of Conventional Physical Data-Driven Models

Deep learning techniques are gaining increasing attention with revolutionizing the approaches of handling engineering problems. In this talk, Dr. Wang will present his group's recent research on three deep-learning techniques, including blackbox knowledge distillation, transfer learning and reinforcement learning, along with their applications in the infection prediction of COVID-19, smart manufacturing and computing resource management. These approaches can be also applied to handle different kinds of physics-based data-driven problems in engineering.

Dr. Wang joined UCF in 2015. His major research interests are deep learning, parallel/cloud computing and software systems, including improving the accuracy, security, privacy of deep learning systems and optimizing performance, scalability, resilience and resource management of big data processing, especially on cloud, GPU, and multicore platforms. His research also includes applying AI techniques to domain applications. He received the NSF CAREER Award in 2011. Prior to joining UCF, he was an assistant and Castagne associate professor at the University of Wyoming. He received a Ph.D. in computer science from State University of New York at Stony Brook.

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