

College of Engineering and Computer Science
FACULTY RESEARCH TALKS

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Zoom talk | Friday, May 22, 2020 | Noon to 1 p.m.



PRESENTER 1:

**HELEN
HUANG**

Asst. Professor,
Mechanical
and Aerospace
Engineering

Advancing Multimodal Neuromechanics and Understanding of Brain Dynamics of Human Locomotion

Developing a comprehensive understanding of the brain processes that govern human locomotion has remained elusive due to technical challenges of measuring brain signals during dynamic tasks. In this talk, Dr. Huang will discuss her research advancing methods using high-density electroencephalography (EEG) to study brain dynamics and neuromechanics during human locomotion and aging. She will also share her vision for the future of multimodal neuromechanics and propose new research collaborations involving brain machine interfaces for gait rehabilitation.

Dr. Huang is an assistant professor in the Department of Mechanical and Aerospace Engineering and is also affiliated with the Biionix and DAT clusters. She directs the UCF Biomechanics, Rehabilitation, and Interdisciplinary Neuroscience (BRaIN) Lab where they investigate the neuromechanics of human locomotion. Dr. Huang was awarded an NIH R01 in 2017 and an NSF CAREER in 2020. Prior to UCF, she was an assistant research scientist at the University of Michigan, Ann Arbor and a NIH T32 Institutional Postdoctoral Fellow at the University of Colorado Boulder. She was also a NIH F31 Individual Predoctoral Fellow and earned her Ph.D. in biomedical engineering from the University of Michigan, Ann Arbor.



PRESENTER 2:

**SHAURYA
AGARWAL**

Asst. Professor,
Civil, Environmental
& Construction
Engineering

Synergizing Data-Driven and Physics-Driven Approaches for Understanding Complex Socio-Cyber-Physical Systems

Physics-driven and data-driven, the two main paradigms for modeling complex socio-cyber-physical systems (SCPS), have their own set of challenges and shortcomings. This talk will highlight the different research thrusts adopted by Dr. Agarwal's group to bridge this gap, including Koopman operator formalism and mean-field games. Potential application areas include urban transportation systems, national electrical power markets and grids, and public health infrastructure dealing with infectious disease containment and vaccination.

Dr. Agarwal received his Ph.D. in Electrical Engineering from the University of Nevada Las Vegas in 2015. He is currently an Assistant Professor in the Civil, Environmental, and Construction Engineering Department at UCF. Previously, he was an Assistant Professor in the Electrical and Computer Engineering Department at California State University, Los Angeles, and completed his post-doctoral research at New York University. His current research interests include data-driven dynamical systems, mean field games, and control theory with application focused on smart cities, connected and autonomous vehicles, and other such socio-technical-infrastructures systems.

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

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PRESENTER 3:
JUNJIAN QI
Asst. Professor,
Electrical and
Computer
Engineering,
RISES Cluster

Smart Grid Control and Resilience

In this talk Dr. Qi will discuss some recent research that attempts to address the emerging challenges during the transformation of the traditional power grid to smart grid. Four topics will be covered: cascading failure analysis and mitigation for enhanced system resilience, advanced microgrid control for large-scale integration of power electronics interfaced renewable generation, application-level techniques for improved cyber-physical system security, and synchrophasor measurement based approaches for better monitoring, protection, and control of power systems.

Dr. Qi received his Ph.D. in Electrical Engineering from Tsinghua University in July 2013. He is currently an Assistant Professor in the Department of Electrical and Computer Engineering at UCF and is also affiliated with the RISES faculty cluster. His primary area of research is smart grid, including cascading failure, microgrid control, cyber physical system security, and synchrophasor. Dr. Qi received an NSF CAREER award in 2020.



PRESENTER 4:
**ABHIJIT
MAHALANOBIS**
Asst. Professor,
Computer Science,
CRCV

Machine Vision for Defense and Aerospace Applications

The field of computer vision has made tremendous strides in recent years that have led to extraordinary gains in many real world applications. However, the popular techniques in main stream computer vision do not address the unique challenges in the defense and aerospace industry. These issues arise because of different types of imaging sensors, operating environments and performance requirements. In this talk, we will review some of these conditions and requirements, and discuss overall approaches for object detection and recognition for defense and aerospace applications.

Dr. Mahalanobis is currently an Assistant Professor in the Center for Research in Computer Vision (CRCV) at the University of Central Florida (UCF). His primary research areas are in video/image processing for target detection and recognition, and computational imaging. He has over 170 journal and conference publications in this area. He also holds four patents, co-authored a book on pattern recognition, contributed several book chapters, and edited special issues of several journals. Dr. Mahalanobis completed his B.S. degree with Honors at the University of California, Santa Barbara in 1984. He then joined Carnegie Mellon University and received MS and Ph.D. degrees in 1985 and 1987, respectively. Prior to joining UCF, Abhijit was a Senior Fellow at Lockheed Martin in Orlando. He has also worked at Raytheon in Tucson, and was a faculty member at the University of Arizona and the University of Maryland. Abhijit is a Fellow of OSA, SPIE, and IEEE. He also served as an associate editor for Applied Optics from 2004-2009, and then again from 2017-2020.

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