



UCF

# FACULTY RESEARCH TALKS

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Zoom talk | Friday, April 22, 2022 | Noon to 1 p.m.



PRESENTER 1:

## **SAM SONG**

Associate Professor,  
Mechanical and  
Aerospace Engineering

### **Robotic Interventions and Biomedical Systems for Healthcare**

In the past few decades, various medical robots and advanced biomedical devices have been introduced and some successful systems are in clinical use. This presentation introduces research areas and recent development activities of the Interventional Robotics Laboratory at the Department of Mechanical and Aerospace Engineering. Current projects include MRI-guided cancer biopsy and focal therapy, a bone-mounted robot for orthopaedic surgery, an advanced telemedicine system utilizing soft robotic tactile display, a semi-robotic laparoscopic assistant system, and a skull-mounted robot for facial surgery.

Dr. Song received a Ph.D. in medical robotics from Imperial College London. He has been working on the development and clinical implementation of robotic interventions and healthcare devices as a hands-on scientist, engineer and inventor. Previously, he worked at leading interdisciplinary research institutes between hospital and university setups, including Western Pennsylvania Hospital, Johns Hopkins University, Harvard Medical School and Harvard Engineering School. Dr. Song joined UCF in 2015 and his current research projects are supported by NIH, NSF and DOD.



PRESENTER 2:

## **THOMAS WAHL**

Assistant Professor,  
Civil, Environmental  
and Construction  
Engineering

### **The Wicked Problem of Coastal Risks Under Climate Change**

Fast-growing coastal communities, where already more than 40 percent of the U.S. population resides and the majority of the nation's gross domestic product is generated, are threatened by a myriad of different climate sensitive hazards. To mitigate the expected ecological and socio-economic impacts in a warming world, integrated adaptation strategies are required. Dr. Wahl will focus his presentation on several recently funded projects where stakeholder-driven interdisciplinary research is conducted to address these wicked problems.

Dr. Wahl received his Ph.D. in civil engineering at the University of Siegen. Before joining UCF in 2017, he was a postdoc at the University of South Florida and EU Marie Skłodowska-Curie Fellow at the University of Southampton. His research focusses on the vulnerability of coastal societies, built infrastructure and fragile ecosystems. He studies changes in sea level, tides, storm surges, ocean waves, freshwater flows and the interactions between them, as well as the associated impacts to explore possible adaptation strategies. At UCF, he received an Early Career Investigator Award from NASA and CAREER Award from NSF, among others.



PRESENTER 3:

## **ZHISHAN GUO**

Assistant Professor,  
Electrical and  
Computer Engineering

### **When Machine Learning Meets Scheduling Theory: Towards Certifiable and Intelligent Real-Time Cyber-Physical Systems**

In the era of cyber-physical systems (CPS), sensing, communication and computing are becoming more affordable and integrated. Many CPS have strict temporal constraints and often of massive scale. This talk briefly discusses recent and ongoing efforts to incorporate reliable, interpretable and transferable machine learning and real-time scheduling techniques for CPS modeling, design and analysis. With various engineering applications, those solutions shed light on handling challenges in energy efficiency, security isolation, system coordination, reliable prediction and control, etc., of modern CPS.

Dr. Guo received his B.Eng. degree in computer science and technology from Tsinghua University, the M.Phil. degree in mechanical and automation engineering from The Chinese University of Hong Kong, and his Ph.D. in computer science from the University of North Carolina at Chapel Hill. His research interests are in real-time scheduling theory and machine learning theory with applications to CPS. Since joining UCF in 2018, Dr. Guo and his group have published more than 20 papers on top-tier (csrcanking) conference venues in both real-time and embedded systems and AI/ML domains, and has received the Best Paper award of EMSOFT, Best Student Paper, Outstanding Paper and Best Industry Solution awards of RTSS. He is a recipient of the UCF Reach for the Stars Award, UNC Chapel Hill CS Department Outstanding Teaching Award, and IEEE Computer Society Outstanding Service Award.