



UCF

FACULTY RESEARCH TALKS

LISTEN. LEARN. COLLABORATE.

Zoom talk | Friday, Oct. 28, 2022 | Noon to 1 p.m.



PRESENTER 1:

LUIGI PEROTTI

Assistant Professor,
Mechanical and
Aerospace Engineering,
Bionix Cluster

Combining Computational Modeling and Cardiac MRI to Develop Biomarkers of Cardiac Health

Cardiac motion is driven by billions of heart cells acting together, whose contraction and relaxation govern cardiac function. In this presentation, Dr. Perotti will introduce how MR image analysis and computational models can be combined to compute new biomarkers of cardiac function and dysfunction. He will discuss a microstructural biomarker of cardiac remodeling based on cardiac diffusion tensor imaging as well as a motion biomarker of cardiac performance based on routinely acquired MR images.

Dr. Perotti's research focuses on computational mechanics. Two main areas of his research are developing new biomarkers of cardiac function and studying deployable structures inspired by the maturation of viral capsids. Dr. Perotti received his Ph.D. in mechanical engineering from Caltech in 2011. He was a postdoctoral scholar at UCLA in MAE and Radiological Sciences after receiving an AHA postdoctoral fellowship; and a project scientist when he received an NIH K25 award and conducted pre-clinical studies. Dr. Perotti joined the MAE department at UCF in 2019.



PRESENTER 2:

BRIAN KIM

Associate Professor,
Electrical and
Computer Engineering

High-Density Neurochemical Probes for Brain Mapping

In this talk, Dr. Kim will discuss his group's efforts to investigate a new modality to interface with the brain using neurochemicals. The research objective is to develop a superresolution neurochemical imaging technique to analyze brain neurochemistry with a nanoscopic spatial resolution and microsecond temporal resolution. He will also discuss his NSF project in developing a multimodal neural probe technology that can map both neural spike activities and neurochemical release/uptake with high spatiotemporal resolution.

Dr. Kim's research areas include next-generation neural interfaces, neurochemical sensors, single-cell electrophysiology and medical diagnostics. His research has been funded by competitive grants from sponsors, including the NIH, NSF, and DoD. He won the 2022 NSF CAREER award. Before joining UCF, he was a senior electrical engineer at Roche Diagnostics in Seattle. He completed his Ph.D. in biophysics at Cornell University, and he received his postdoctoral training in bioengineering at the University of California, Berkeley.



PRESENTER 3:

THOMAS WAHL

Associate Professor,
Civil, Environmental
and Construction
Engineering,
UCF Coastal

The Effects of Spatiotemporal Storm Surge Clusters on Coastal Flood Risk

When multiple storm surges, or other hazards, affect the same area in relatively close succession (i.e., temporal clustering) or when longer coastlines stretches are often impacted simultaneously by the same storm surge event (i.e., spatial clustering), compounding effects in time and space with potentially devastating impacts to coastal communities occur. The goal of this project is to illuminate where existing dependencies in space and time make such events more likely, how they are changing through time, and how humans and the built environment are affected by them.

Dr. Wahl received his Ph.D. in civil engineering in 2012 at the University of Siegen in Germany. Before joining UCF in 2017, he was a postdoc at USF and EU Marie Skłodowska-Curie Fellow at the University of Southampton in the UK. His research focuses 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.