



UCF

FACULTY RESEARCH TALKS

LISTEN. LEARN. COLLABORATE.

Zoom talk | Friday, Oct. 18, 2024 | Noon to 1 p.m.



PRESENTER 1:
**VEERARAGHAVA
RAJU HASTI**

Assistant Professor
School of Modeling,
Simulation and
Training

Artificial Intelligence-Driven Adaptive Digital Twins for Sustainable Energy Systems

Dr. Hasti's interdisciplinary research at the intersection of engineering, computer science, environment and economics is focused on the development of transformational digital tools and technologies using physics-based and data-driven artificial intelligence approaches. These tools are intended to enable low emission, connected, resilient, reliable, safe, affordable and smart systems for a sustainable future. In this talk, he will present sustainable fuels characterization, predictive maintenance and techno-economic models for powerplant cycling cost of operations subject to intermittent renewable energy sources. He will also cover the development of scientific machine learning models for adaptive digital twins to enable real-time simulations of energy systems.

Dr. Hasti received master's and doctoral degrees in mechanical engineering with a concentration in computational science and engineering from Purdue University in 2016 and 2019 respectively, and a mini-MBA from Purdue in 2018. Prior to joining UCF, he was a research assistant professor at Purdue and then at N.C. State University. Dr. Hasti's research interests are artificial intelligence and scientific machine learning, digital twins, immersive visualization and simulations, computational fluid dynamics, predictive maintenance, energy systems modeling and simulations, sustainable energy, and propulsion technologies. He isw chair of the Gas Turbine Engines Technical Committee of AIAA.



PRESENTER 2:
**ALEKSANDRA
PETELSKI-KULIK**

Assistant Professor
Materials Science and
Engineering

Leveraging Mass Spectrometry Proteomics Towards Biomedical Applications

Dr. Petelski-Kulik's research involves the use of mass spectrometry, a highly sensitive tool that has enabled the accurate quantitation of thousands of proteins in biological samples as small as a single cell. In this presentation, she will describe how global proteomic measurements can be used towards systematic understanding of protein homeostasis in musculoskeletal disease and cancer, knowledge that can be leveraged for innovative material design.

Her lab aims to exploit the heterogeneity of single cell proteomes towards building better biomaterials. Prior to her current position, Dr. Petelski-Kulik co-founded Parallel Squared Technology Institute, a non-profit research organization dedicated to drastically scaling up the throughput of mass spectrometry proteomics without sacrificing accuracy. She earned her doctoral degree in bioengineering from Northeastern University. Her research interests include mass spectrometry proteomics, single-cell analysis, cell-material interactions, bioinformatics and posttranscriptional regulation.



PRESENTER 3:
**RAMEES KHALEEL
RAHMAN**

Research Assistant
Professor, Mechanical
and Aerospace
Engineering

Improving Chemical Kinetic Mechanisms to Aid in the Design and Development of Low Carbon Gas Turbines

In this presentation, Dr. Khaleel Rahman will present his work on advancing gas turbine combustion technology for lowering carbon emissions by generating accurate chemical kinetic mechanisms for computational fluid dynamics simulations. He will share the chemical kinetic mechanism improvement/reduction for gas turbine combustors operating on blends of ammonia/hydrogen as fuels conducted as part of the Department of Energy initiative funded by GTI Energy.

Dr. Khaleel Rahman has a doctorate in mechanical engineering from the University of Central Florida. His master's and bachelor's degrees are in chemical engineering from Khalifa University and the National Institute of Technology Calicut, respectively. Dr. Khaleel Rahman's interests are in chemical kinetic modeling, laser absorption spectroscopy and laser diagnostics.