



UCF

FACULTY RESEARCH TALKS

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Zoom talk | Friday, Oct. 27, 2023 | Noon to 1 p.m.



PRESENTER 1:

KAUSIK MUKHOPADHYAY

Assistant Professor
Materials Science and
Engineering

Augmented Injectable Foams for Rapid-Action Hemostatic Treatment

Hemorrhage is the main cause of preventable death on the battlefield. Nearly 50% of combat deaths have been due to exsanguinating hemorrhage, without timely intervention and appropriate care. In his talk, Dr. Mukhopadhyay will present a novel, two-component silicone-based hemostatic bandage system that is both antibacterial and self-expanding. Upon delivery, the two parts chemically react in situ to form a stretchable and expandable foam that generates autogenous pressure on the wound to control bleeding through easy delivery.

Dr. Mukhopadhyay directs the Hybrid Materials Lab, where he works at the interface of surface science, chemistry, biology and engineering to develop solutions for exciting research problems related to coatings, membranes, electrochemistry, catalysis, sensors and wound healing. Dr. Mukhopadhyay leads projects funded by the DHS-FEMA, UCF ER1, FSGC and NASA. He is a member of the Undergraduate Research Council and MSE Undergraduate ABET Committee that received its first ABET accreditation. Dr. Mukhopadhyay obtained his Ph.D. from the National Chemical Laboratory and M.S. from the University of Calcutta, both in chemistry. While in industry, he was the vice president and PI on projects funded by the Army, ONR, Air Force, CBD, NASA, OSD and DOE.



PRESENTER 2:

SHRUTI VYAS

Assistant Professor
Materials Science
and Engineering,
Artificial Intelligence
Initiative

Transforming Industries and Everyday Life with Computer Vision

In this presentation, Dr. Vyas will introduce her research on applications of computer vision. She will talk about geolocalization which is crucial for U. S. military and law-enforcement personnel. In GPS-denied regions, images and videos can be used for identifying location and to complement other systems. She will also talk about using vision for the health check of photovoltaic modules, showcasing its potential in enhancing renewable energy efficiency.

Dr. Shruti Vyas holds a Ph.D. in chemical engineering from National University of Singapore and an undergraduate degree from the Indian Institute of Technology (BHU) Varanasi. Her postdoctoral work at the UCF Center for Research in Computer Vision focused on deep learning and effective representation learning. Dr. Vyas aims to integrate AI into experimental research, particularly in materials science and engineering. Notably, her work in automating defect detection in photovoltaic modules secured \$90K in DOE funding through the American-Made Solar Prize's software track, reflecting her commitment to innovative, cross-disciplinary research.



PRESENTER 3:

YUE WEN

Assistant Professor
Mechanical
and Aerospace
Engineering, Disability,
Aging and Technology
Cluster

Toward Human-Robot Symbiosis with Intelligent Robot and Neural-Machine Interface for Personalized Assistance

In this presentation, Dr. Wen will introduce his research on seamless human-robot symbiosis through intelligent robot and advanced neural-machine interfaces. Specifically, Dr. Wen will share proposed machine learning methods to personalize robotic lower-limb prostheses to match individuals' physical condition, including body weight, through human-in-the-loop optimization. He synthesizes deep learning and high-density electromyography techniques to extract real-time and high-accuracy movement intention in the form of neural drive to muscles for voluntary control of wearable robots.

Dr. Wen was a postdoctoral researcher at Shirley Ryan AbilityLab (formerly RIC) and Northwestern University prior to coming to UCF. He received a Ph.D. in biomedical engineering from the joint Department of Biomedical Engineering at North Carolina State University and University of North Carolina at Chapel Hill in 2019. His research interests include human-in-the-loop personalization of wearable rehabilitation robots, neural-machine interfaces, AI for robotics and neural interfaces, and motor rehabilitation to improve the quality of life for clinical populations.