



UCF

UNIVERSITY OF CENTRAL FLORIDA | ORLANDO

College of Engineering and Computer Science
FACULTY RESEARCH TALKS

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Zoom talk | Friday, April 9, 2021 | Noon to 1 p.m.



PRESENTER 1:

OZLEM OZMEN

Assistant Professor,
Industrial Engineering
and Management
Systems

Artificial Intelligence-Assisted Nanomaterial Design and Fairness in AI

In this presentation, Dr. Ozmen will discuss her research on applied artificial intelligence with a focus on two areas: nano-material design and social systems. She will present a study to develop a machine learning modeling approach to assist in the discovery of nanomaterials to combat COVID-19. Dr. Ozmen will also discuss the social consequences of algorithmic decision making and the bias introduced by machine learning systems that increasingly manage multiple aspects of our lives, including finance, workforce management and healthcare.

Dr. Ozmen directs the Human-Centered Artificial Intelligence Research Lab (Human-CAIR Lab). Prior to that, she served as the Director of Research Technology. Her areas of research are big data, social media analysis, social cybersecurity, artificial social intelligence, human-machine teams, social and economic networks, network science, STEM education analytics, higher education economic impact and engagement, artificial intelligence, evolutionary computation, and complex systems.



PRESENTER 2:

**HYOUNG JIN
"JOE" CHO**

Professor,
Mechanical and
Aerospace Engineering

Rock, Paper, Scissors: Creating Low-Cost Devices for Environmental Monitoring and Remediation

The detection and remediation of pollution events caused by natural and human-made disasters require reliable, rapid and low-cost devices in resource-limited regions where a sophisticated laboratory infrastructure is lacking. Dr. Cho will present various facile fabrication technologies developed in his lab to address this challenge. Without resorting to the traditional cleanroom fabrication, these methods could produce low-cost monitoring and mitigating devices with nano to microscale features on paper, fabric and plastic substrates.

Dr. Cho's research interests are in miniaturized sensors and sample handling devices. He has published more than 120 peer-reviewed journal and proceeding papers, and holds 12 patents in the U.S., as well as six patents in Korea. Dr. Cho earned his Ph.D. in electrical engineering from the University of Cincinnati in 2002, and his B.S. and M.S. in materials engineering from Seoul National University in 1989 and 1991 respectively. From 1993 to 1997, he worked as research engineer at Korea Electronics Technology Institute. Dr. Cho received the NSF CAREER award in 2004.

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

For more information, and to see previous talks, visit www.cecs.ucf.edu/faculty-research-talks



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PRESENTER 3:

**SUMANTA
PATTANAİK**

Associate Professor,
Computer Science

Realistic Rendering and Visualization

In this talk, Dr. Pattanaik will discuss his group's efforts in the field of computer graphics and visualization, including the realistic rendering of 3D material and volumetric medical data. He has developed algorithms for realistic rendering of huge grass terrains, trees and large urban terrains. In addition, he has developed algorithms for simulating the interaction of light on soft materials and simulating natural light phenomena such as caustics and translucency. Dr. Pattanaik will also discuss his recent work on incorporating the wave nature of light into ray-traced rendering for simulating the effect of light interference, diffraction and polarization on the realistic rendering of 3D objects.

Dr. Pattanaik received his Ph.D. in computer science in 1993 from Birla Institute of Technology and Science, Pilani, India. Before joining UCF in 2001, he worked for six years as a researcher for Cornell's Program of Computer Graphics, and for two years at the IRISA research lab as an Inria post-doctoral researcher. Dr. Pattanaik has published more than 100 articles in peer-reviewed journals and conference proceedings, and holds one patent. He teaches computer graphics and data visualization classes at both the graduate and undergraduate level.



PRESENTER 4:

**KIMINOBU
SUGAYA**

Professor,
Burnett School of
Biomedical Sciences,
College of Medicine

Exosomal Analysis for Biomarkers

Exosomes – micro-vesicles secreted by cells – contain various molecules and can pass through the blood-brain barrier. They can also protect their cargo from degradation and diffuse into body fluids such as saliva, urine and blood. Thus, analysis of biomarkers in exosomes could help assess the brain's pathological conditions in a non-invasive manner. Previous studies have shown that microRNA levels in exosomes are useful for detecting cancer. Dr. Sugaya published the differential exosomal DNA sequence that may be used as a marker for cancer. He is investigating the possibility of using amyloid- β in exosomes as a biomarker of Alzheimer's disease using immuno-PCR. In addition, Dr. Sugaya is searching for a technology to conduct these analyses in a single exosome, revealing information on specific cells in the brain for a better diagnosis of neurological diseases.

Dr. Sugaya joined UCF in 2004. He came from Japan to the Mayo Clinic as a postdoc and became an associate consultant in 1994. He then moved to the University of Illinois at Chicago as an assistant professor, where he started stem cell research to treat neurodegenerative diseases. Dr. Sugaya has filed more than 60 patents at UCF, some of which are the result of collaborations with UCF's engineering faculty. His research focuses on the use of exosomes for diagnosis and drug delivery. Dr. Sugaya's latest invention is COVID-19 therapy using exosomal delivery of therapeutic molecules.

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