



UCF

UNIVERSITY OF CENTRAL FLORIDA | ORLANDO

College of Engineering and Computer Science
FACULTY RESEARCH TALKS

LISTEN. LEARN. COLLABORATE.

Zoom talk | Friday, Feb. 26, 2021 | Noon to 1 p.m.



PRESENTER 1:

**BRUCE
CAULKINS**

Research Assistant
Professor,
School of Modeling,
Simulation and
Training

Advancing Technologies in Cyber Training Environments via Cyberwerx

In this talk, Dr. Caulkins will discuss a series of initiatives to advance needed technologies in cyber training environments within the Cyberwerx framework. Cyberwerx was created in 2020 to identify and assess future capabilities as they relate to future Persistent Cyber Training Environment (PCTE) requirements, to validate findings with U.S. Army sponsors, and to perform a training effectiveness study of the current PCTE baseline. PCTE is a Department of Defense training platform which currently supports the military's individual sustainment training, team certification, mission rehearsal and provides the foundation for collective training exercises.

Dr. Caulkins became the director for the Modeling and Simulation of Behavioral Cybersecurity program in 2015, teaching more than 20 graduate-level classes while securing and managing approximately \$6 million in funding from various government agencies. Prior to 2015, he retired as a colonel after 28 years in active-duty service in the U.S. Army, culminating a military career focused on cyber planning, exercises, and communications support to the warfighter.



PRESENTER 2:

**SALVADOR
ALMAGRO-
MORENO**

Assistant Professor,
Burnett School of
Biomedical Sciences,
College of Medicine

Ecological and Evolutionary Approaches to Unravel Pathogen Emergence

In this talk, Dr. Almagro-Moreno will discuss his recent findings on the emergence and evolution of bacterial pathogens, with an emphasis on the intestinal pathogen *Vibrio cholerae*, and *Vibrio vulnificus*, a poorly understood emergent zoonotic pathogen source of a fulminant septicemia. He will discuss how using a holistic research approach that encompasses a mix of molecular microbiology, genomics and ecology can shed light on the complex phenomenon of pathogen emergence.

Dr. Almagro-Moreno's lab investigates the emergence and evolution of bacterial pathogens. His team's ultimate goal is to gain knowledge that will allow them to effectively forecast the traits of emergent virulent strains, predict the sources of outbreaks and to design and produce reliable therapeutics against bacterial threats. Prior to coming to UCF, Dr. Almagro-Moreno was the E. E. Just Postdoctoral Fellow at Dartmouth College and a Science Foundation Ireland Graduate Fellow at University College Cork, where he earned his Ph.D.

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:

**AXEL
SCHÜLZGEN**

Professor,
CREOL, The College of
Optics and Photonics

Opportunities Created by In-House Optical Fiber Fabrication

Fiber optics is an integral part of the modern optical technologies. However, there are only a few academic institutions that have a strong focus on fiber optics in their optics research and education. A comprehensive fiber optics program has been developed at the University of Central Florida within CREOL, The College of Optics & Photonics, in the last decade. Dr. Schülzgen will present an overview of the fiber optics facilities that have been established at CREOL and a selection of research activities in various fiber optic technology areas.

Dr. Schülzgen received his Ph.D. in Physics from Humboldt-University in Berlin, Germany. He came to UCF in 2009 and also holds an adjunct research professor position at the College of Optical Sciences, University of Arizona. Dr. Schülzgen's current research interests include optical fiber devices, components, materials, and structures with applications in fiber laser systems, fiber optic sensing and imaging, and optical communications. He has authored more than 150 scientific publications in peer-reviewed journals, shared more than 65 invited talks at international conferences and holds six patents. Dr. Schülzgen is a fellow of the Optical Society of America and the International Society for Optics and Photonics SPIE, and a member of the German Physical Society.



PRESENTER 4:

**RONALD
DeMARA**

Pegasus Professor,
Computer Science,
Electrical and
Computer Engineering

Energy-Efficient p-bit based Stochastic Neuromorphic Architectures

Emerging non-volatile electronic devices can enable new pathways to mimic synaptic behaviors for machine learning applications, as opposed to conventional complementary metal-oxide-semiconductor (CMOS) circuits. Dr. DeMara will introduce his research related to developing an energy-efficient and biologically inspired long-term memory (LTM) to short-term memory (STM) architecture to mimic both biological STM and LTM synaptic connections and timing dependencies of the stimuli, via volatile and nonvolatile hybrid spin-CMOS devices with respect to some selected synaptic memory reinforcement rules.

Dr. DeMara is a Digital Learning Faculty Fellow at UCF, where he has been a full-time faculty member since 1993. His interests are in computer architecture, post-CMOS devices, and reconfigurable fabrics. He has applied these to autonomous, embedded and intelligent/neuromorphic systems, on which he has completed more than 300 articles, 50 funded projects as PI or Co-PI totaling \$14.2M with one patent granted and one provisional patent. He has served as Ph.D. dissertation and/or MS thesis advisor to 50 graduates. He was previously an associate engineer at IBM and a visiting research scientist at NASA Ames, in total for four years, and has been a registered professional engineer since 1992.

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

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