UNIVERSITY OF CENTRAL FLORIDA | ORLANDO

College of Engineering and Computer Science

FACULTY RESEARCH TALKS

LISTEN. LEARN. COLLABORATE.

Zoom talk | Friday, Feb. 5, 2021 | Noon to 1 p.m.

PRESENTER 1:

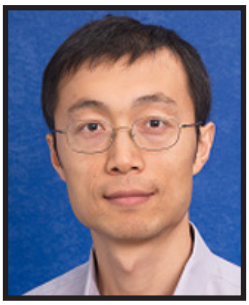
ROGER AZEVEDO

Professor, Department of Learning Sciences and Educational Research

Augmenting Human-Machine Intelligence with Data Analytics

Augmenting human-machine intelligence with data analytics is critical for enhancing learning, reasoning and problem solving of complex real-world scenarios (e.g., pandemics). Data analytics can play key roles in detecting, tracking, modeling and fostering humans solving complex real-world scenarios by allowing machines to intelligently provide just-in-time feedback and scaffolding to support humans. Dr. Azevedo will discuss the need for augmenting human-machine intelligence via data analytics, illustrate how different types of data analytics (e.g., open learner models) can be used to augment and support humans while soling complex problems, and propose several interdisciplinary solutions for human-machine augmentation that address the challenges of the 21st-century workforce.

Dr. Azevedo received his Ph.D. from McGill University and completed his postdoctoral training in cognitive psychology at Carnegie Mellon University. He is an affiliated faculty in the Departments of Computer Science and Internal Medicine at UCF and the lead scientist for the Learning Sciences Faculty Cluster Initiative. His overarching research goal is to understand the complex interactions between humans and intelligent learning systems by using interdisciplinary methods to measure cognitive, metacognitive, emotional and motivational processes and their impact on learning, performance and transfer. He has published more than 300 peer-reviewed papers, chapters and refereed conference proceedings.



PRESENTER 2:

CLIFF ZOU

Associate Professor, Computer Science, Cyber Security and Privacy Cluster

Privacy Attacks on Internet of Things and Voice Over IP Based on Encrypted Network Traffic

Even with secured encryption, network traffic could still expose serious private information. In this talk, Dr. Zou will present two realistic privacy attack threats even when the network traffic is encrypted and secured. In the Internet of Things (IoT), an attacker could eavesdrop on Wi-Fi traffic to know what IoT devices exist in a home or business, including their working status and brands. In voice over IP, an attacker could infer a customer's detailed actions when calling an automated phone service.

Dr. Zou received his Ph.D. from the University of Massachusetts at Amherst, and MS and BS degrees from the University of Science and Technology of China. He serves as the program coordinator for the MS in Digital Forensics program. His research interests are cybersecurity and computer networking. Dr. Zou has published more than 100 peer-reviewed research papers, has more than 7,000 Google Scholar citations and is a senior member of the Institute of Electrical and Electronics Engineers.

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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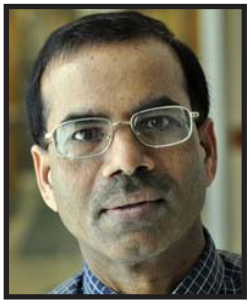

PRESENTER 3:
ARAVINDA KAR
Professor,
CREOL, The College of Optics and Photonics

Laser-Assisted Nanoparticle Deposition and Doping of Semiconductors for Sensor Fabrication

Thermofluidic interactions between lasers and nanoparticle droplets form the foundation for creating novel device structures at low costs. Two advanced laser techniques, nanoparticle electrospray laser deposition and laser doping, will be discussed. While the former technique enables additive manufacturing of novel structures using nanoparticles, the latter paves the way for fabricating a new type of photodetector for detecting infrared radiation, including the midwave infrared (MWIR, 3-5 mm) spectral range. The laser-doped detectors operate under an optical principle in contrast to conventional electrical detectors. Various applications of MWIR photodetectors include pollution detection, industrial process monitoring, chemical forensics, chemical and biological warfare, and non-invasive medical diagnostics.

Dr. Kar received in Ph.D. in physics from the University of Illinois at Urbana-Champaign. He conducts research in the area of laser-matter interactions for advanced materials processing. He is a fellow of the National Academy of Inventors, a fellow of the Laser Institute of America and the co-author of “Theory and Application of Laser Chemical Vapor Deposition.”

PRESENTER 4:
TALAT RAHMAN
Pegasus Professor,
Department of Physics

Defect-Laden 2D Materials for Conversion of Synthetic Gas to Higher Alcohols: Insights from Theory and Experiments

There is an ongoing quest for cheap and abundant catalysts that would facilitate the hydrogenation of CO2, an abundant greenhouse gas in the Earth’s atmosphere, and CO, a poisonous exhaust, into fuels and chemicals traditionally derived from petroleum. The recent popularity of 2D materials has also turned attention to their feasibility as promising catalysts for a variety of reactions. Dr. Rahman will share results of collaborative computational and experimental examinations of the conversion of synthetic gas to methanol, ethanol and other value-added products on two 2D materials: molybdenum disulfide and hexagonal boron nitride. She will highlight the important role defects play, without which the basal planes of these materials would seem inert.

Dr. Rahman received her Ph.D. in physics from the University of Rochester. Her multidisciplinary research interests are computational design of functional nanomaterials through microscopic understanding of their physical and chemical properties based on first principles. She has led the effort in the physics department to transform undergraduate instruction through evidence-based, active learning strategies. Dr. Rahman is active with PhysTEC and the Bridge Program of the American Physical Society to help prepare physics majors for careers in teaching and to recruit graduate students from underrepresented minority group into physics. She works closely with experimental groups worldwide, who help make her research relevant.

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