College of Engineering and Computer Science

FACULTY RESEARCH TALKS

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Zoom talk | Friday, Nov. 6, 2020 | Noon to 1 p.m.

PRESENTER 1:
MINGJIE LIN
Associate Professor,
Electrical and
Computer
Engineering

Massively-Parallel Reconfigurable Computing with Security and Autonomy

Massively parallel field programmable gate array (FPGA) reconfigurable computing devices have been widely used in data center and computing accelerators. Recent emerging artificial intelligence and machine-learning applications have further spurred the FPGA-based computing research. In this talk, Dr. Lin will briefly describe his ongoing research on FPGA-based secure computing systems and its application on autonomous computing. In addition, he will share a recent FPGA-based educational project he is working on in collaboration with Intel.

Dr. Lin received his Ph.D. in electrical engineering from Stanford University. He worked at FPGA startup Tabula Inc. as a senior engineer and as a post-doctoral scholar at the University of California, Berkeley. Since joining UCF at 2011, Mingjie's research has focused on exploring novel ways to construct scalable, embedded computing machines with high performance and low power consumption. He is an SAIC Faculty Fellow and a recipient of the 2016 NSF CAREER award, the 2017 UCF Reach for Stars award and the 2017 UCF Teaching Incentive Program award.

PRESENTER 2:
SANG-EUN SONG
Associate Professor,
Mechanical
and Aerospace
Engineering

Robotic Intervention and Assistive Healthcare Systems

In the past few decades, various medical robots and advanced biomedical devices have been introduced and some successful systems are in clinical use. This presentation introduces research areas and current development activities of the Interventional Robotics Laboratory. His current research includes robotic orthopedic surgery, MRI-guided cancer biopsy and focal therapy, soft robotic tactile display and advanced telemedicine systems.

Dr. Song received his Ph.D. degree in medical robotics from Imperial College London, U.K. He has been working on the development and clinical implementation of robotic interventions and healthcare devices as a hands-on scientist, engineer and inventor. Prior to joining UCF, he served as a research associate for the School of Engineering and Applied Sciences at Harvard's Wyss Institute for Biologically Inspired Engineering, and as an instructor for Harvard Medical School. Dr. Song was also a research scientist for the Johns Hopkins Laboratory for Computational Sensing and Robotics, and for Western Pennsylvania Hospital's Institute for Computer Assisted Orthopedic Surgery. Dr. Song joined UCF in 2015.

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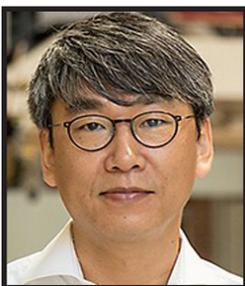
PRESENTER 3:
TENGFEI JIANG
Assistant Professor, Materials Science and Engineering, Advanced Materials Processing and Analysis Center

Materials Research for Interconnect and Packaging Reliability in Advanced Microelectronics Systems

In the IoT era, advanced microelectronics systems such as 2.5D and 3D integrated circuits have emerged to meet the ever-increasing performance and connectivity demands. While new materials and structures are necessary to enable these technologies, unique reliability challenges have also emerged due to stress and materials interactions under the application conditions. In this talk, Dr. Jiang will discuss her group's efforts in using combined experimental and simulation approaches to investigate material behaviors, interactions and the failure mechanisms that dictate the reliability of the interconnect and packaging components. The goal of her work is to develop materials and processing-based solutions that lead to improved reliability of advanced interconnect and packaging systems.

Dr. Jiang's research interests are in materials reliability for interconnect and packaging, where metrology, materials characterization, fabrication, and modeling are combined to address the critical reliability challenges in advanced microelectronics systems. She is also interested in applying machine learning to address reliability issues and develop material-based solutions. She received her Ph.D. from the University of Texas at Austin in 2015 and her M.S. from The Ohio State University in 2009, both in materials science and engineering. Her work has been funded by National Science Foundation and several industry sponsors.

PRESENTER 4:
HAE-BUM "ANDREW" YUN
Associate Professor, Civil, Environmental and Construction Engineering, Center for Research in Computer Vision

Surface and Subsurface Condition Assessment for Large Road and Rail Networks

In this talk. Dr. Yun will discuss rapid and reliable condition assessment techniques for large transportation infrastructure networks. For road infrastructure, high-resolution 3D surface and subsurface segmentation maps can be obtained from digital images and ground penetrating radar scans combined with deep learning algorithms. For rail infrastructure, mobile sensing techniques are developed using non-contact photoluminescence piezospectroscopy to monitor excessive rail stress.

Dr. Yun's research interests include structural health monitoring, computer vision and machine learning, and spectroscopy-based noncontact sensing techniques for large civil infrastructure systems and networks. Dr. Yun's research has been supported by various public agencies and private companies, including the National Science Foundation, the U.S. Department of Transportation, the Florida Department of Transportation and the Korea Ministry of Land, Infrastructure and Transport. Dr. Yun received his Ph.D. from the University of Southern California and his M.S. from Carnegie Mellon University.