UNIVERSITY OF CENTRAL FLORIDA | ORLANDO

UCF

College of Engineering and Computer Science

FACULTY RESEARCH TALKS

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Zoom talk | Friday, Oct. 16, 2020 | Noon to 1 p.m.

PRESENTER 1:

YASER P. FALLAH

Associate Professor, Electrical and Computer Engineering

Cooperative AI for Connected and Automated Vehicles

Automated vehicle technologies have been progressing at a fast pace during the last decade; yet, their safe and large-scale deployment remains a challenge due to technical difficulties in perception and decision-making tasks. Recent advancements in wireless communication allow augmenting both perception and decision-making components. Dr. Fallah will introduce cooperative AI techniques, including how machine-learning methods for sharing and processing of information from cooperating vehicles can improve operation of connected or automated vehicles.

Dr. Fallah's recent research has focused on cooperative AI in automated driving and safety systems. His research interests include stochastic modeling and machine learning, wireless communication, perception/sensing and decision-making topics as they apply to cyber-physical networked systems such as autonomous vehicles and smart energy systems. Dr. Fallah received his Ph.D. from the University of British Columbia, Canada and was a research scientist at the University of California, Berkeley. He received the NSF CAREER award in 2015.

PRESENTER 2:

LUIGI PEROTTI

Assistant Professor, Mechanical and Aerospace Engineering, Biionix Cluster

Using Computational Biomechanics to Study Cardiac Function and Morphing Viral Shells

Computational models can uncover the mechanisms governing macro- and micro-scale biological systems. Dr. Perotti will introduce two main applications of his computational models to study cardiac function and shape changes of viral capsids during maturation. MRI-based computational models can help better understand cardiac electrophysiology, kinematics and mechanics in health and disease. The same theoretical and modeling tools are then applied to understand how basic subunits deformation drives global capsid shape changes during virus maturation.

Dr. Perotti's research focuses on computational mechanics. Two main areas of his research are developing numerical methods to study cardiac function and dysfunction based on subject-specific MRI and modeling the maturation of viral shells to utilize the mechanisms driving their large shape changes. Dr. Perotti received his Ph.D. in mechanical engineering from the California Institute of Technology. He was a postdoctoral scholar at the University of California, Los Angeles in mechanical and aerospace engineering and radiological sciences after receiving an American Heart Association postdoctoral fellowship, and a project scientist when he received a National Institutes of Health K25 award and conducted pre-clinical studies. Dr. Perotti joined UCF in 2019.

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

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PRESENTER 3:
LADISLAU BOLONI
Professor,
Computer Science

Deep Learning Without Big Data

Big data has played an important part in the recent successes of deep learning. However, there are many applications where huge datasets are not available — there is a need to train from a modest amount of often unsupervised data. This talk will cover examples from robotics manipulation (deep imitation learning) and image classification (unsupervised meta-learning) that show that deep learning is possible with several orders of magnitude smaller datasets than previously thought possible.

Dr. Boloni's research focuses on the practical applications of artificial intelligence and machine learning. He takes the "agent stance" of artificial intelligence, focusing on decision problems that an agent sensing and acting in the world needs to take. This covers applications ranging from robot manipulation to sensor networks, and underwater vehicles to human-AI social interaction. Dr. Boloni received a Ph.D. in computer science from Purdue University and a B.Sc. in computer engineering from the Technical University of Cluj Napoca in Romania. His group's papers have been published at NeurIPS, AAAI, CVPR, ICRA and others.

PRESENTER 4:
MURAT YUKSEL
Professor,
Electrical and
Computer Engineering

Directional and Optical Wireless for Mobile Networking and Lighting

Recent proliferation of wireless technologies and choices available to user applications has triggered a tremendous wireless demand, and wireless nodes are expected to dominate the Internet soon. As the RF spectrum is getting saturated, innovations that will enable new wireless spectrums and substrates are needed to respond to the exploding mobile wireless traffic demand. Enabling new spectrum bands above 30 GHz (such as millimeter-wave, optical and terahertz bands) in wireless communications is the needed revolution for high-speed mobile networks of the future. In this talk, Dr. Yuksel will explore the potential for optical and/or highly directional wireless systems to make this possible in the context of high-speed mobile ad-hoc and opportunistic networking.

Dr. Yuksel received a B.S. in computer engineering from Ege University in Turkey and his M.S. and Ph.D. in computer science from Rennselaer Polytechnic Institute. He was a software engineer at Pepperdata and a visiting researcher at AT&T Labs and Los Alamos National Laboratory. Dr. Yuksel's research interests are in networked, wireless and computer systems with a focus on wireless systems, optical wireless, spectrum sharing, network economics, network architectures, cloud networking and network management. He has served on the editorial boards of *Computer Networks* and *IEEE Networking Letters*. Dr. Yuksel has published more than 150 papers in peer-reviewed journals and conferences, and is a co-recipient of Best Paper, Best Paper Runner-Up and Best Demo awards.

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