COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

FACULTY RESEARCH TALKS

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Zoom talk | Friday, July 8, 2022 | Noon to 1 p.m.

PRESENTER 1:
STEVEN DURANCEAU
Professor,
Civil, Environmental and Construction Engineering

Operations Research Partnerships with Municipal Utilities

Safe and readily available drinking water is essential for human survival. In this talk, Dr. Duranceau will discuss his group's research that identifies approaches to help public water systems lower overall costs and provide sustainable drinking water now and in the future. Water and wastewater systems face ever-increasing challenges of stricter water quality regulations and aging treatment and distribution system infrastructure. Dr. Duranceau will discuss examples of his group's work on integrating applied research into municipal water and wastewater utilities to better understand complex physical, chemical, and microbiological issues that impact the cost and performance of utility infrastructure operations.

Dr. Duranceau's research is focused on water and wastewater quality, treatment, storage and distribution system infrastructure with specialization in process operations. He has supervised many Ph.D. and M.S. students who have conducted water quality research in central and coastal Florida, Georgia, and California, as well as in the Cayman, Hawaiian and Marianas Islands. Dr. Duranceau is director of the Environmental System Engineering Institute that specializes in conducting water quality engineering studies. Prior to joining UCF in 2007, he served as an executive of a national design engineering firm and was engineer-of-record for several advanced drinking water plant designs in Florida. Dr. Duranceau is a licensed professional engineer in Florida and serves on several journal editorial boards. He holds a B.S. in chemistry, M.S. in industrial chemistry, and a Ph.D. in environmental engineering.

PRESENTER 2:
DAVID MOHAISEN
Associate Professor,
Computer Science

Securing Wearables Against Machine Learning-Enabled Threats

To keep up with ever-growing user expectations, developers keep adding new features to augment the use cases of wearables, such as fitness trackers, augmented reality head mounted devices (AR HMDs), and smart watches, without considering their security and privacy impacts. In this talk, Dr. Mohaisen will introduce recent results on understanding the privacy dimension of wearables through inference attacks facilitated by machine learning and associated defenses.

Dr. Mohaisen received his Ph.D. from the University of Minnesota in 2012 and has been with UCF since 2017. His research interests are in the broad area of applied security and privacy, covering aspects of networked systems, software systems, IoT and AR/VR, machine learning, and blockchain systems. His research has been supported by NSF, NRF, AFRL, AFOSR, etc., and published in top conferences and journals alike, with multiple best paper awards. His work was featured in *New Scientist, MIT Technology Review, ACM Tech News, Science Daily*, etc. He is an associate editor of IEEE TMC and IEEE TPDS. He is a senior member of ACM (2018) and IEEE (2015), a Distinguished Speaker of the ACM and Distinguished Visitor of the IEEE.

PRESENTER 3:
RICKARD EWETZ
Assistant Professor,
Electrical and Computer Engineering

Towards Efficient, Robust, and Explainable Artificial Intelligence

Recent innovations within artificial intelligence (AI) have resulted in astonishing results within generative model, reinforcement learning, and multi-modal learning. For example, AlphaStar developed by DeepMind can beat the top human players in the real-time strategy game StarCraft II. However, the use of AI in high-assurance applications is still impeded by the lack of techniques to explain the AI decision making to humans, and the vulnerability to adversarial attacks. In this talk, Dr. Ewetz will discuss his group's efforts to improve the explainablity and robustness of AI systems. He will also discuss his work on efficiently accelerating AI and big data applications using in-memory computing and non-volatile memory.

Dr. Ewetz received his Ph.D. in electrical and computer engineering from Purdue University in 2016. His research interests includes the broad areas of artificial intelligence, machine learning, emerging computing paradigms, non-volatile memory, and design automation. He has two best paper award nominations from DATE and ASP-DAC in 2021 and 2019, receptively. His research group is supported by DARPA, NSF, and Cyber-Florida.

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