

I Spy with My Little Eye: Building Trust via Common Dynamic Context

Time: 3:00 pm – 4:00 pm, Oct 19th, 2021

Location: Dale Hall 0206

Abstract: The convergence of the physical and cyber worlds in the form of networked systems capable of collaboratively sensing and interacting with the surrounding environment has enabled a plethora of groundbreaking new applications including fully autonomous driving and vehicular networks (vehicle-to-everything), unmanned aerial vehicle (UAV) networks, VR/AR sensing, body area networks for health applications, tactile/haptic Internet, and others. Critical to the safety, security, and privacy of these applications are the authenticity, veracity, and integrity of the information that is used to coordinate and command common actions. However, the complex integration of multi-modal physical sensing, computation, and communication creates a particularly challenging environment to safeguard. As prior research has revealed, traditional information security methods fail to extend desired security properties to the physical world. In this talk, we discuss a contextual trust paradigm where randomness drawn from the surrounding environment is used as a common context to bind the digital identities of the interacting entities with the measured physical properties. We use vehicular networks as a running example and show how random context can be exploited to verify vehicle platooning and prove location claims, in general.

Biography: Dr. Loukas Lazos is a Professor of Electrical and Computer Engineering at the University of Arizona. He received his Ph.D. in Electrical Engineering from the University of Washington in 2006. In 2007, he was the co-director of the Network Security Lab at the University of Washington. Dr. Lazos joined the University of Arizona in August 2007 where he leads the Network and Information Security Lab. His broad research interests are in the areas of wireless network security, user privacy, and communications, with emphasis on secure protocol design, resilience, and fair resource allocation. Recently, he has focused in projects related to the security of vehicular networks, resilience of mmWave communications, trust establishment for IoT, dynamic and fair spectrum access, private information retrieval, and secure cloud storage. He is a recipient of the NSF CAREER Award (2009) for his work in security of multi-channel wireless networks. His research has been funded by the National Science Foundation and the U.S. Department of Defense, including the Army Research Office (ARO) and the Office of Naval Research (ONR). He is an associate editor for the IEEE Transactions on Information Forensics and Security (T-IFS) journal and the IEEE Transactions on Mobile Computing (TMC) journal.

