

ECE Distinguished Lecture Series



Dr. Fil Bartoli

Professor at Lehigh University
IEEE Fellow

Internet of the Future – Where Goest Thou? (From AI/ML to Advanced Wireless and Quantum Networks)

Thursday, November 12th, 11:00am

URL: <https://gwu.webex.com/gwu/j.php?MTID=m3c69bba00c11558bc3c30ef87e8877cd>

Meeting Number: 120 956 3644

Password: gvY3vmehS47

Abstract

The internet has had an immense influence on many facets of our society, and has become a key driver for change in business, education, health, and national security. This societal impact is only expected to accelerate in the coming decades as access to increasingly large data sets, computational power, and wireless networking continue to grow and connected networked systems become more decentralized. This lecture will discuss several potential paths along this journey, some exciting research challenges, and obstacles that must be overcome.

Technological breakthroughs in artificial intelligence and machine learning (AI/ML) enable intelligent systems to take on increasingly sophisticated tasks. However, significant obstacles remain, including the availability of real-time machine learning for control and decision making in dynamic networked systems. Advances in secure, high-speed wireless systems will also be required, for example, to connect autonomous vehicles in future transportation systems. Since security is one of the paramount concerns for many applications, one must ask if the internet of the future can be quantum and secure. This talk will also discuss the long-term prospects for quantum networks.

While very challenging, the research directions discussed above fall squarely within reported US research priority areas, such as the Industries of the future and NSF's Big Ideas.

Biography

Dr. Fil Bartoli recently completed a four-year term as Director of the Division of Electrical, Communications and Cyber Systems (ECCS) in the Directorate for Engineering at the National Science Foundation (NSF). The ECCS Division promotes fundamental research in devices and components, power, controls, computation, networking, communications, and cyber technologies to support the integration and networking of intelligent systems. He was Chandler Weaver Chaired Professor and Chair of the Department of Electrical and Computer Engineering at Lehigh University for eleven years. Previously, he spent many years at the Naval Research Laboratory in Washington, DC, where he was the Head of the Advanced Materials Section in the Optical Sciences Division. Professor Bartoli is a Fellow of the Optical Society of America (OSA) and the Institute of Electrical and Electronics Engineers (IEEE). He was Editor-in-Chief of the IEEE Selected Topics in Quantum Electronics Journal, served as IEEE Photonics Society Vice President for Finance and Administration, and was recipient of the 2014 IEEE Photonics Society Distinguished Service Award. His research activities cover a broad range of areas including optoelectronics, nonlinear optics, semiconductors and quantum well device physics. His recent research interests are focused on nanophotonics and plasmonics for biosensors, solar cells, and slow light applications. Professor Bartoli has over 320 published papers in addition to 20 patents.