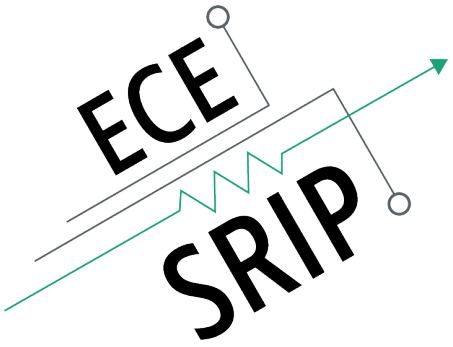

FACULTY MENTOR

Hsueh, Tzu-Chien & El Amili, Abdelkrim

PROJECT TITLE

Electrical and Optical Links Modeling and Budget Analyses

PROJECT DESCRIPTION

Modern high-performance computing networks, Ethernet, data centers, artificial intelligence systems have heavily replied on high-speed electrical and optical links to maintain massive amounts of data communication bandwidths for both servers and clients in cloud networks, instantaneous responses in self-driving vehicles, rack-to-rack CPU/memory accesses, and the structure depth of deep learning algorithms. Link modeling and link budget analysis are always the key of optimizing the entire link performance with proper specifications for integrated photonic/electrical circuit building blocks. In this project, the hired students will not only understand the relationship between high-level systems and physical-layer integrated circuits, but also experience digital signaling processing, device/circuit modeling, jitter/noise modeling, eye-diagram analysis, and BER measurements in MATLAB for high-speed wireline electrical and optical communication systems.

INTERNS NEEDED

2 MS Students

PREREQUISITES

ECE154A, ECE161B, ECE164, ECE165 or their equivalents are required. ECE166, ECE250, ECE251A/B, ECE260A/B, ECE264B/C/D, ECE265A are preferred.

FACULTY MENTOR
Hsueh, Tzu-Chien & El Amili, Abdelkrim

PROJECT TITLE
Low-Power Integrated Lidar Circuits and Systems

PROJECT DESCRIPTION
3D lidar imaging technologies have been broadly used in advanced industrial, medical, scientific, and consumer applications, for example, self-driving cars, drones, robots, and brain imagers. To make lidar technologies more affordable and accessible, this project will mainly focus on the development of low-cost and low-power integrated lidar systems in both electronic and photonic chips. Multiple sub-topics will be conducted during the summer, including optical modulation schemes, detection circuit design and photonic devices modeling. The hired students will also have opportunities to experience circuit simulations, signal processing, data analyses, and hand-on experiments in Ultrafast-and-Nanoscale Optics Group and Integrated Communication Circuits Lab.

INTERNS NEEDED
1 M.S. student in Photonics. 1 M.S. student in Electronic Circuits & Systems.

PREREQUISITES
Photonics: ECE183, ECE184, ECE185 are preferred.
Electronics: ECE154A, ECE161B, ECE164, ECE165 or their equivalents are required.
ECE166, ECE250, ECE251A/B, ECE260A/B, ECE264B/C/D, ECE265A are preferred.