

# Dr. Ali Sheikholeslami's Circuit Intuitions Lecture at the University of Calgary

On 19 November 2019, the Southern Alberta Section of the IEEE Solid-State Circuits Society (SSCS) and IEEE Circuits and Systems Society (CASS) Joint Technical Chapter welcomed Distinguished Lecturer Dr. Ali Sheikholeslami to the University of Calgary, Alberta, Canada. Dr. Sheikholeslami is a professor in the University of Toronto's Department of Electrical and Computer Engineering. He has coauthored more than 70 publications and 10 patents. In addition to his research achievements, he is the SSCS vice president

of education and has received many teaching awards.

During his talk, "Circuit Intuitions," Sheikholeslami discussed, in detail, his *IEEE Solid-State Circuits Magazine* "Circuit Intuitions" column series, focusing on "Looking Into a Node" [1]. He provided attendees with a detailed explanation of the effective use of Thevenin and Norton equivalent circuits to gain intuition into the operation of transistor-level analog circuits. The talk provided undergraduate and early graduate students with tools to begin their analog-circuit education by developing an intimate understanding of how circuits

behave, leading to future innovation in circuit design. The lecture was attended by 94 undergraduate students, seven graduate students, and three faculty members.

—Alexander Sheldon  
Vice chair, SSCS/CASS  
Southern Alberta

—Leonid Belostotski  
Chair, SSCS/CASS  
Southern Alberta

## Reference

- [1] A. Sheikholeslami, "Looking into a node," *IEEE Solid-State Circuits Mag.*, vol. 6, no. 2, pp. 8–10, 2014. doi: 10.1109/MSSC.2014.2315062.

Digital Object Identifier 10.1109/MSSC.2020.2987229

Date of current version: 24 June 2020



Dr. Ali Sheikholeslami (kneeling center) poses with lecture attendees.

## IEEE CAS-EDS-SSCS Wuhan Joint Chapter and Wuhan International Institute of Microelectronics Organize a Technical Talk by Dr. Patrick Chiang

The IEEE Circuits and Systems Society (CAS), IEEE Electron Devices Society (EDS), and IEEE Solid-State Circuits Society (SSCS) Wuhan Joint Chapter and the Wuhan International Institute of Microelectronics, Huazhong University of Science and Technology

(HUST), jointly organized a technical talk by Dr. Patrick Chiang, Fudan University, on 13 November 2019, at HUST, Wuhan, China. The event attracted 30 attendees from HUST, the Institute of Semiconductors at the Chinese Academy of Science, and Hubei University of Technology.

Dr. Chiang's lecture was "Beyond Moore's (O2E) Optics-of-Everything."

Systems that combine electronics and photonics are growing rapidly in this "more-than-Moore" era. Next-generation computing systems are fundamentally limited by power consumption, from extreme-scale data centers to energy-scavenging biomedical sensors. Meanwhile, cloud-computing applications such as big data, the Internet of Things,

Digital Object Identifier 10.1109/MSSC.2020.2987230

Date of current version: 24 June 2020



Prof. Xuecheng Zou, dean of the Wuhan International Institute of Microelectronics, HUST, promotes the SSCS before Dr. Chiang's talk.

cloud computing, deep learning, and autonomous vehicles require exponentially increasing bandwidth, resulting in the explosive growth of optical networking. For these optical input/outputs (I/Os), microchips and silicon photonics are critical innovations, as they directly affect cost, size, power, bandwidth, scalability, and manufacturability.

*Dr. Chiang presented a complete overview of state-of-the-art techniques and research in silicon optics communication.*

Dr. Chiang introduced future prospects for optical communication, including applications in data centers, 3D human-face identification, and vehicle radar. He talked about his recent studies in silicon optics communication, especially chip design techniques. He also discussed state-of-the-art academic R&D and commercialization, including the following:

- *CMOS-based optical interconnects and silicon photonics:* High-speed electrical I/Os above 25 Gb/s (cloud computing, 5G networks) have reached both bandwidth-



Dr. Chiang presents his lecture, "Beyond Moore's (O2E) Optics-of-Everything."



Dr. Chiang joins attendees and organizers of the talk at the HUST campus (second row, from left): Dr. Run Min (committee member), Prof. Zou (committee member), Prof. Chiang, Dr. Yong Ping Xu, and Prof. Anjin Liu.

distance and power-cost limits. Chiang discussed details about recent commercialization of CMOS-based silicon photonics, optical pulse-amplitude modulation with four levels, and 5G fronthaul.

- *3D sensing and deep learning:* Next-generation 3D sensing is accelerating in consumer electronics (facial recognition), augmented reality, and autonomous vehicles (lidar). Dr. Chiang reviewed details of several key chip-level breakthroughs to enable 3D sensing everywhere, including time of flight and 3D artificial intelligence.

Dr. Chiang presented a complete overview of state-of-the-art techniques and research in silicon optics communication. The talk was well received and gave attendees from research institutes and universities an insight into advances in silicon optics communication.

—Run Min  
Committee member,  
IEEE CAS-EDS-SSCS Wuhan  
Joint Chapter

—Chao Wang  
Chair, IEEE CAS-EDS-SSCS Wuhan  
Joint Chapter