IEEE SSCS Montréal Chapter Hosts Lecture

On 4 November 2019, the IEEE Solid-State Circuits Society Montréal Chapter was pleased to host Prof. Ali Sheikholeslami, University of Toronto. Sheikholeslami gave an excellent talk, "Basics of Jitter in Wireline Communications," touching on introductory materials as well as advanced topics. The presentation was well attended by undergraduate and graduate students as well as local industry members. This introduction to the topic of jitter and wire-

Prof. Sheikholeslami (seventh from right) joins audience members after his lecture.

line communication inspired many of the students to take a fourth-year elective, Mixed-Signal Very-Large-Scale Integration for Communication Systems, during the following term at Concordia University.

IEEE SSCS and tinyML Hold First Young Professionals Webinar

On 26 May 2020, the IEEE Solid-State Circuits Society (SSCS) launched the inaugural installment of a new SSCS webinar series, Webinars for Young Excellence (WYE), a joint initiative led by the SSCS Young Professionals (YPs) Committee in collaboration with the SSCS Webinars Committee. The WYE program serves, but is not limited to, YPs and is intended to help participants gain more insight into industrial design trends and practices, collect career advice, present research ideas, and more. This new series complements the monthly SSCS webinar program,

SSCS Webinars for Young Excellence

Inaugural Episode

**The Intersection of SSCS and AI
A Tale of Two Journeys**

Vivienne Sze   Boris Murmann

The webinar announcement.

which focuses on technical tutorials and developments.

The first WYE episode, "The Intersection of SSCS and AI: A Tale of Two Journeys," was jointly hosted with the Tiny Machine Learning (ti-

nyML) Committee. The event drew more than 650 remote attendees. Prof. Vivienne Sze, Massachusetts Institute of Technology, and Prof. Boris Murmann, Stanford University, discussed their research on the intersection of ICs and artificial intelligence (AI), recounted how their established research expertise evolved into AI applications, and offered sound advice on how to get into the game. Sze focused on energy-efficient processors for video compression and autonomous navigation applications, while Murmann covered embedded machine learning for sensor interfaces. Both speakers emphasized the importance of examining the intersection between different areas of research

Low-Power Design for Video Compression

- H.264/AVC Used to Decode Over 80% of Video Content Online
- Voltage Scaling and Parallelism to Reduce Power Consumption
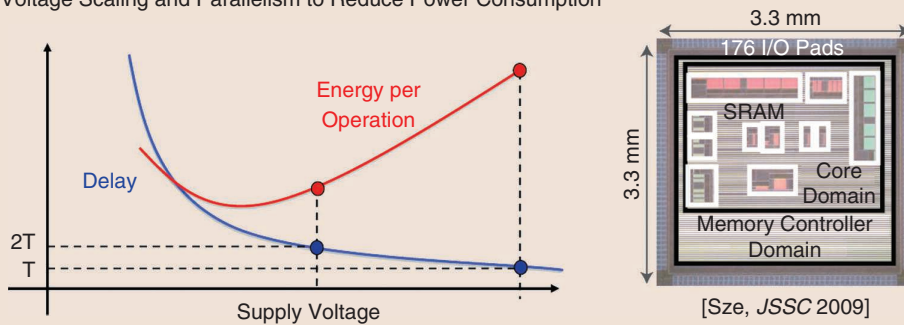
Achieves High-Definition (720-p at 30 fps) Decoding at Under 2 mW
**Over 6x Lower Power Than State of the Art**

Vivienne Sze (🐦 @eems_mit) [Joint Work With Anantha Chandrakasan, Daniel Finchelstein, Mahmut Sinangil] Mir

A slide from Prof. Sze's presentation, showing the delay and energy consumption relationship for video compression applications. AVC: advanced video coding; I/O: input/output; SRAM: static random-access memory; JSSC: *IEEE Journal of Solid-State Circuits*; fps: frames per second.
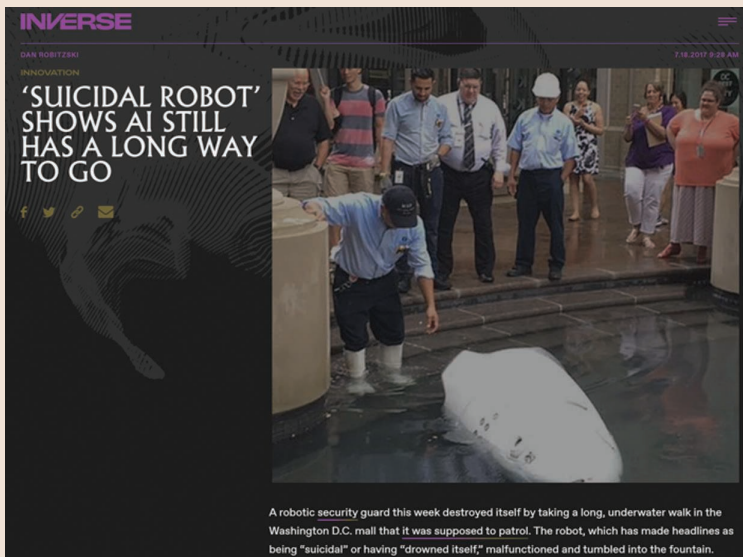
Another slide from Prof. Murmann's presentation.

for opportunities and fostering collaboration as a necessity for success. Murmann offered an optimistic "sandwich" analogy to convince the audience that IC designers are perfectly positioned to collaborate and contribute. The presentation concluded with a live Q&A. The webinar is now available at the IEEE SSCS Res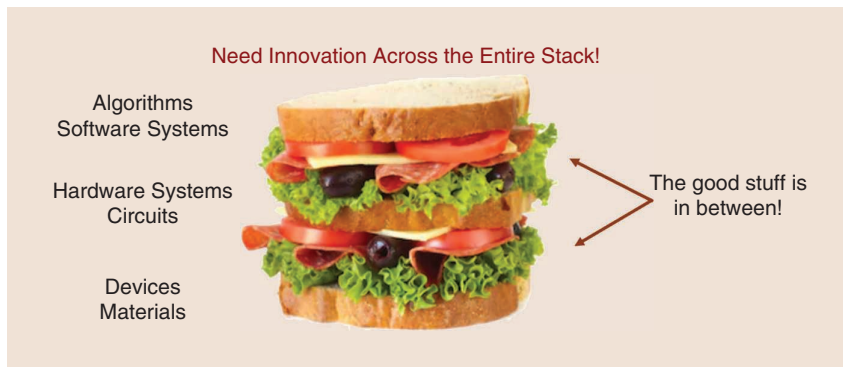ource Center. Going forward, our goal is to offer quarterly WYE installments. Stay tuned for upcoming WYE announcements.

Testimonials from webinar participants included the following:

- "The webinar was well organized, and the speakers were clear and informative. With the AI space becoming a major part of the future of electronics, this webinar was a nice introduction to the space from a circuits perspective." —*Dr. Imran Ahmed, StarIC, Canada*

- "Pure joy listening to the two delightful presentations by the academic leaders in circuit design for AI, one digitally oriented and the other with some interesting analog twists. I feel inspired to dive deeper into this exciting area that will certainly spawn lots of circuit design activities in the near future. Too bad that Boris has publicly denied the existence of AI...." —*Prof. R. Bogdan Staszewski, University College Dublin, Ireland*

- "It was a great pleasure listening to the professors, who are leading the possible intersection between circuit design and AI. As an analog designer, I enjoyed exploring areas on which I can make an impact. The key nontechnical advice to me was "Be an expert in some field, but stay open to opportunities outside your comfort zone." —*Baris Volkan Yildirim, STMicroelectronics, Singapore*

- "Profs. Sze's and Murmann's excellent presentations showed the necessity of considering the 'full stack,' from the semiconductors

Need Innovation Across the Entire Stack!

Algorithms
Software Systems

Hardware Systems
Circuits

Devices
Materials

The good stuff is in between!

A slide from Prof. Murmann's presentation, illustrating his sandwich analogy indicating the advantageous position of IC designers for collaborations.

on up, encompassing the hardware, software, and algorithms, to build practical and efficient machine learning applications. Beyond the concept of codesign, stretching beyond one's specialty to other domains is required to solve challenging machine learning problems. The tinyML Foundation believes collaborative partnerships like this one with the IEEE SSCS are essential to support the cross-functional community involved in ultralow-power machine learning at the edge. We look forward to another event as soon as possible." —*Ira Feldman, tinyML, United States*

—Sevil Zeynep Lulec, Alvin Loke, Xinfei Guo, Ka-Meng Lei, Po-Hsuan Wei, Shahriar Mirabbasi, Abira Altvater, and Kelsey Rodriguez

IEEE SSCS Oregon Chapter Remembers Dr. Barrie Gilbert, Recognizes Award Winners

The start of 2020 brought some exciting news for IEEE Solid-State Circuits Society (SSCS) Oregon Chapter members and also some very sad news. Dr. Barrie Gilbert, IEEE Life Fellow, who helped relaunch the SSCS Oregon Chapter, sadly left us on 30 January 2020 after a fall at his home in Portland, Oregon. He was a naturally gifted circuit designer who started experimenting with circuits at age nine. Gilbert became one of the most famous analog circuit designers in the world.

In 1979, Gilbert founded the first remote design center for Analog Devices, which was located in Portland. The Oregon SSCS Chapter was relaunched in 2018, with its first technical seminar, "Electron Tornadoes, Paper Circuits, and Semiconductor Spinning Tops," presented by Gilbert. The auditorium was filled with young and old SSCS members, all of whom were entertained by Gilbert's talk and the opportunity to

Dr. Farhana Sheikh, IEEE SSCS Oregon Chapter chair.

see the cool devices he brought with him from his home museum. The Oregon Chapter will miss Gilbert and his dedicated support.

February brought exciting news to select members of the IEEE SSCS Oregon Chapter. Dr. Christopher Hull, Dr. Stefano Pellerano, and their team from Intel were awarded the prestigious International Solid-State Circuits Conference (ISSCC) 2019 Lewis Award for Outstanding Paper and the 2019 Demonstration Certificate of Recognition for their work "A Scalable 71-to-76-GHz, 64-Element

Phased-Array Transceiver Module With 2 × 2 Direct-Conversion IC in 22-nm FinFET CMOS Technology." In addition to Hull and Pellerano, SSCS members who were acknowledged with awards are as follows:

- Dr. Steven Callender
- Dr. Woorim Shin
- Dr. Yanjie Wang
- Dr. Somnath Kundu
- Dr. Abhishek Agrawal
- Peter Sagazio
- Brent Carlton
- Dr. Farhana Sheikh
- Dr. Arnaud Amadjikpe
- Dr. William Lambert
- Divya S. Vemparala
- Mark Chakravorti
- Satoshi Suzuki
- Robert Flory.

Due to COVID-19 restrictions, the Chapter had to improvise on monthly meetings. In March and April, online conference calls were held with the Executive Committee, and it was decided to start working on holding online events. The Chapter virtually hosted its first SSCS Distinguished Lecturer, Prof. Dejan Markovic,