SOCCER Rematch Expands Field to Five Schools

Stanford Defends Title

Sparked by interest in last year's first Soccer and Circuits Collaboration and Education Retreat (SOCCER) event, the number of attendees at its second iteration on 23–25 May increased to include 90 people representing seven different research groups from five universities. Founding professors Un-Ku Moon [Oregon State University (OSU)] and Boris Murmann (Stanford University) returned to face challengers Hossein Hashemi [University of Southern California (USC)], Ali Niknejad [University of California, Berkeley (UC Berkeley)], Dejan Markovic [University of California, Los Angeles (UCLA)], Arun Natarajan (OSU), and Amin Arbabian (Stanford). The weekend-long event offered each school an opportunity to demonstrate its skills in analog circuit design as well as, of course, soccer.

Upon arriving at the hotel in Mount Shasta, the retreat began with an evening of socializing and networking as professors and students gathered in the hotel bar to swap stories and bond over the mutual experiences of graduate school. As time progressed, their talk became more lighthearted and boasts of soccer prowess from each research group increased.

Saturday morning opened with a poster session in the hotel conference room that included 18 posters on a variety of analog and mixed-signal topics. Presentations and follow-up dialogue lasted for several hours and forged many new connections that Prof. Hashemi audibly deemed, "More productive than ISSCC!" By early afternoon, anticipation for the soccer tournament grew to a boiling point as the researchers packed up their presentation materials and made their way across town to scenic Shastice Park to begin the matches.

> ***Against the backdrop of snow-capped Mount Shasta, the reigning champion Stanford team faced off against a combined USC/UCLA group in the first round.***

Against the backdrop of snow-capped Mount Shasta, the reigning champion Stanford team (composed of Murmann and Arbabian students) faced off against a combined USC/UCLA group in the first round. The

SOCCER participants against the backdrop of Mount Shasta.

Martin Kraemer (Stanford) presenting his SAR ADC research.

Digital Object Identifier 10.1109/MSSC.2014.2349834
Date of publication: 12 November 2014

Participants from four different schools discuss a poster.

Mahmoud Saadat (Stanford) steals the ball from a UCLA opponent.

Spencer Leuenberger (OSU) shows off his fancy footwork against a UC Berkeley defender.

expertise of Stanford's front line could not be matched, and Stanford cruised to an easy 2–1 victory.

The second semifinal game pitted OSU against UC Berkeley. Again, the experience of being a second-year competitor prevailed, and OSU scored a record number of goals for a 5–1 win. OSU forward Robert Pawlowski commented, "We really came together as a team during that game. All the extra practice we put in to get ready this year definitely paid off."

After a short rest the OSU team took the field again for the championship match against Stanford. Fatigue was evident, as OSU struggled to keep up with the Stanford onslaught. Two early goals were surrendered, and Stanford succeeded in protecting its 2–0 lead throughout the second half. Farshad Farahbahkshian remarked, "Stanford has a couple of very strong players, so we are looking forward to those two guys graduating!" As the final whistle sounded, Stanford celebrated its tournament victory and back-to-back championships and retained possession of the SOCCER boomerang trophy. The tournament concluded with an on-field barbecue dinner, with festivities continuing late into the evening.

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On its final day, the retreat began with a 3.8-mi hike along the McCloud River, featuring three waterfalls and spectacular scenery. Afterward, the groups said their final good-byes and parted ways to return to their respective universities. All parties agreed that the event had been a great success and look forward to continuing it next year.

The Presentations

The presentations that were given during the retreat are as follows.

The prestigious Boomerang Trophy, with Stanford's consecutive championships.

At the Lower Waterfall on the McCloud River.

Stanford University

- Ryan Boesch and Boris Murmann, "Low-Power Inductorless Feed Forward Equalizer for High-Speed Links"
- Bill Chen and Boris Murmann "Digitally Assisted High-Speed Sampling Circuit"
- Martin Kraemer and Boris Murmann, "High-Resolution SAR ADC Using a Source-Follower Input Buffer"
- Jon Spaulding and Boris Murmann, "Finite Rate of Innovation: Sub-Nyquist Sampling for Ultrasound Imagers"
- Jayant Charthad, Marcus Weber, Jerry Chang, and Amin Arbabian, "Ultrasonic Energy Transfer for Deeply-Implanted, mm-Sized Medical Devices."

Oregon State University

- Allen Waters, Spencer Leuenberger, and Un-Ku Moon, "High Speed Current Steering DACs"
- Yue Hu, Farshad Farahbakhshian, and Un-Ku Moon, "Time Amplifiers Based on Phase Accumulation"
- Jason Muhlestein, Jerry Leung, and Un-Ku Moon, "Time Assisted SAR ADCs"
- Brandilyn Coker and Un-Ku Moon, "Implementation of a Blind Background Calibration Algorithm for Nonlinearity Correction."

University of Southern California

- Kunal Datta, "mm-Wave Stacked Class-E Power Amplifiers in Silicon"
- Marcelo Segura, S. Niranjayan, Andreas Molisch, and Hossein Hashemi, "Cooperative Synchronization for Distributed Sensors over Ultra-Wideband in Complex Multi-Path Environments"
- Behnam Analui, Tim Mercer, Ankush Goel, Sam Mandegaran, and Hossein Hashemi, "0.05-6 GHz 2x2 MIMO CMOS Software-Defined Transceiver."

University of California, Los Angeles

- Chaitali Biswas, Vahagn Hokhikyan, and Dejan Markovic, "Many-Channel Neural Wireless Telemetry"
- Dejan Rozgic and Dejan Markovic, "uTEG Power Supplies for Spin Torque Oscillators."

University of California, Berkeley

- Andrew Townley, Paul Swirhun, and

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the formation of the Chapter and introduced them to the mission and major activities of the Society.

To begin his DL presentation, "Bio-Inspired Smart Vision Sensors and Processing Systems," Prof. Van der Spiegel reminded listeners that biology provides us with a fascinating example of an intelligent, low- power, and highly efficient sensory system. He continued by describing a wireless brain-machine-brain interface system whose purpose is to effectively link the brain to external hardware to create new sensory and motor pathways for persons suffering from neurological disorders. His work on neuromorphic vision sensors includes on-chip processing modeled after the biological system, and he explained how advances in CMOS technology have made it feasible to build microelectronic systems that mimic some of the key features found in biology.

The SSCS Administrative Committee has recognized continuing education and grassroots person-to-person networking as the Society's most powerful contributions to members' careers.

Prof. Howard Luong lecture was "A Fully Integrated CMOS Frequency Synthesizer for Software-Defined Radios," presenting the design and measurements of a fully integrated frequency synthesizer for software-defined radios (SDRs) that meets both the frequency and phase noise requirements for all wireless standards from 47 MHz to 10 GHz. These included the 14-band UWB, and the 802.15.3c standard from 57 GHz to 66 GHz. Implemented in a 0.13-µm CMOS process, the synthesizer prototype occupies an active area of 3 mm^2, consumes a total power of 33–83 mW, and achieves a measured phase noise of –139.6 dBc/Hz at 3 MHz offset from a 1.7-GHz carrier.

Prof. Tzi-Dar Chiueh presented "Baseband IC Design for Wireless MIMO Systems," addressing the design considerations of wireless MIMO technology and covering several crucial issues such as MIMO detection, iterative receiver, and related signal processing techniques. He said the application of MIMO technology to consumer wireless communications has arisen only recently, as exemplified by 802.11n/ac and LTE/LTE-A standards. A few baseband IC design examples showed how digital IC technology can enable ubiquitous high-speed wireless communications.

The starting point of "Energy Efficient SAR-Type ADC Design: Trends and Design Considerations," by Prof. Seng-Pan U (Ben) was the domination by SAR-type ADCs of large segments of high-speed and energy efficient ADCs that have efficiencies down to fJ/conversion step at 100-MHz+ sampling rate. After summarizing the state of the art of high-energy-efficient ADCs, Prof. U surveyed ADC trends in energy, speed, and noise analysis for various architectures including SAR and binary-search, multibit SAR, flash SAR, pipeline SAR, time-interleaved, and others, ending with a thorough update on recent advances through June 2014.

—Qiang Li
Chair, SSCS-Chengdu

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PEOPLE *(Continued from p. 65)*

Ali Niknejad, "94 GHz FMCW Radar"

- Krishna Settaluri, Sen Lin, Sajjad Moazeni, Chen Sun, and Vladimir Stojanovic, "Electronic-Photonic Heterogeneous Integration (EPHI)"
- Greg LaCaille, Luke Caldrin, Steven Callender, and Ali Niknejad, "3–24 GHz LO Generation for Frequency Interleaved ADC"
- Siva Thyagarajan, Shinwon Kang, and Ali Niknejad, "Sub-THz Wireless Chip-to-Chip Communication."

—Allen Waters
Oregon State University

TEN SSCS MEMBERS ELEVATED TO SENIOR GRADE IN AUGUST AND SEPTEMBER

Manuel C Blanco	Princeton/Central Jersey Section
Brian Brandt	New Hampshire Section
Kent Layton	Utah Section
Roy Olsson	Albuquerque Section
Christoph Studer	Houston Section
Michael Tan	Malaysia Section
Vivek TD	Bangalore Section
Feng Wan	Macau Section
Bernhard Wicht	Germany Section
AlanChiWai Wong	U.K.& Rep of Ireland Section

Digital Object Identifier 10.1109/MSSC.2014.2365962
Date of publication: 12 November 2014

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