

Conference Reports

Report on the 2018 IEEE/ACM International Symposium on Low Power Electronics and Design

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■ **THE IEEE/ACM INTERNATIONAL** Symposium on Low Power Electronics and Design (ISLPED) is the premier forum for the presentation of innovative research in all aspects of low power electronics and design. The conference has a unique mix of topics attacking power and energy optimization at all levels of the design space from circuit design to high-level architectures, as well as software optimizations. The ideas here can help run your electronics on smaller batteries or push the density of data centers.

This year, the conference was held at the Hyatt Regency, Bellevue, WA, USA, from 23 to 25 July 2018 and was attended by a total of 124 registered attendees. This is the 23rd year of the conference, and we are continuing to push the boundaries of low-power technology. Once again, ISLPED has an extremely competitive program, with 150 submissions narrowed down to 35 regular papers and 16 poster presentations. The technical program committee nominated four of the 35 regular papers for consideration as best paper awards, and the final selection committee identified two Best Papers, “CLINK: Compact LSTM Inference Kernel for Energy Efficient Neurofeedback Device,” by Zhe Chen, Andrew Howe, Hugh T. Blair, and Jason Cong of UCLA and “Computing in Memory with FeFETs,” by Dayane Reis, Michael Niemier, and X. Sharon Hu of the University of Notre Dame.

The Technical Program this year was headed by Co-Chairs Saibal Mukhopadhyay (Georgia Tech) and Matthew Ziegler (IBM). They have done a wonderful job in assembling a top-notch 91-member Technical Program Committee to ensure the highest quality program for our conference, and the countless hours from the TPC have allowed us to put together an exciting program. Charles Augustine (Intel) and Yongpan Lui (Tsinghua University) were the Design Contest co-chairs of this year, and their contest highlights design innovations targeting power efficiency.

The conference included three exciting keynote speakers. Prof. David Blaauw, University of Michigan, discussed unlocking new Internet of Things application domains through an ultralow-power



Best Paper Award winners Dayane Reis and X. Sharon Hu with Program Co-Chairs Matthew Ziegler and Saibal Mukhopadhyay.

Digital Object Identifier 10.1109/MDAT.2018.2873454

Date of current version: 29 November 2018.

mm-scale sensor node design. Dr. David Ditzel, Esperanto Technologies, revisited 40 years of low-power reduced instruction set computing and predictions for the future. Dr. Flavio Ribeiro, Microsoft, described power-efficient embedded sensing, perception, and intelligence at the edge.

In addition to the main technical program, the conference included a variety of invited talks and special sessions. The special session on “Far-Out Ideas” included speakers from Howard Hughes Medical Institute, the Boeing Company, and the Quantum Computing Architectures group at Microsoft. These speakers covered an extremely wide-ranging set of topics, discussing the biological circuit architecture of the visual cortex of fruit flies, challenges, and solutions for microelectronics in space, and approaches for quantum computing architectures. A second special session on “Industry ML/AI Compute” invited a group of industry experts to discuss varying microelectronics approaches to accelerate machine learning and artificial intelligence applications, and it included speakers from IBM, Microsoft, Syntiant, and Intel.

Following the machine learning/artificial intelligence (ML/AI) special session, our industry speakers were all invited to participate in a panel discussion moderated by Prof. Todd Austin of the University of Michigan. The panelists were asked to debate the question “Is AI really the future of computing?” and faced tough and pointed questions from an animated audience deconstructing the acceleration strategy of each participant.

On the final day, the conference included one last special session on the Defense Advanced Research Projects Agency/Semiconductor Research Corporation (DARPA/SRC) Joint University Microelectronics

Program (JUMP), a multicenter research consortium sponsored by DARPA and SRC. Three of the six JUMP centers presented their research vision and how it relates to challenges investigated by the low-power electronics and design research community.

The entire 2018 Organizing Committee worked extremely hard to bring attendees the best conference experience. The Publicity Chair Jing Li (University of Wisconsin–Madison) spread the word about the conference. Our Industrial Liaison, Jack Sampson (Pennsylvania State University), secured significant financial support for the conference. Publication Chair Michael Laurenzano (Cling) cleared us through assembling the final proceedings. The committee is rounded out with Akshtha Sriraman (University of Michigan) and Visvesh Sathe (University of Washington) handling the web page and local arrangements. Finally, a sincere thanks to the ISLPED Executive Committee headed by Massoud Pedram for their vision and guidance for the long-term success of the conference.

ISLPED 2018 received generous financial support from IBM, Intel, and Microsoft. ISLPED 2018 is cosponsored by the IEEE Circuits and Systems Society and the ACM Special Interest Group on Design Automation, with technical support from the IEEE Solid-State Circuits Society.

THE NEXT ISLPED will take place in Lausanne, Switzerland. Watch <http://www.islped.org/> for more details. ■

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