July 2018

Currents

CEDA

IEEE Council on Electronic Design Automation

## *Cadence Support for IEEE CEDA Events*

On April 11, IEEE CEDA and Cadence Design Systems, Inc. signed a framework sponsorship agreement. The purpose of the sponsorship is to enable a systematic, worldwide process to collaborate in the multidisciplinary technical areas of mutual interest within the technical scope covered by CEDA in IEEE. Cadence, through the Cadence Academic Network department, agrees to sponsor multiple pre-selected CEDA related technical Events during each calendar year, such as conferences, workshops, tutorial or technical activities in local CEDA chapters. These Events include, for example, major EDA conferences, such as DATE, ICCAD, and ASP-DAC.

Cadence will provide monetary or logistic support (e.g., provide Cadence-related products or licenses) for the Events to help develop specific activities related to Cadence's interests. These activities relate to technical areas within IEEE of CEDA, embedded systems, cyber-physical systems, as well as the following topics from the IEEE Future Direction Committee where CEDA actively participates as a core member: IEEE Internet-of-Things (IoT), IEEE Smart Cities, IEEE Rebooting Computing and IEEE BigData.

The agreement enables participating universities to use Cadence technology products in their research and will provide them with leading-edge innovative Cadence tools. In return, Cadence benefits from enhancing its brand recognition within academia, among both professors and students. It also enables Cadence to build a relationship network with professors for future research collaboration and provides Cadence with access to graduate students.

## *SMACD 2018 – EDA Competition*

An EDA competition sponsored by CEDA took place recently during the SMACD/PRIME collocated event in Prague, Czech Republic, July 2-5. The competition required the submission of a full paper, a presentation by the contesting student(s), and a live demonstration of the EDA tool. Seven research student groups competed, presenting a diverse set of high quality tools, including tasks, such as antenna design for digital communication systems and Pareto-driven optimization for analogue circuits.

The high participation of female researchers, about half of the presenters, was extremely positive, demonstrating an improving gender balance in the field. The contestants were evaluated by a jury committee consisting of four members from industry, academia, and CEDA.

Three awards were given with a monetary award of $1,000 for the first place provided by CEDA. The awarded tools and presenter were: "ReSeMBleD- Methods for Response Surface Model Behavioral Description," M. Taikken, University of Bremen (3rd place), "ToPoliNano & MagCAD: a Complete Framework for Design and Simulation of Digital Circuits based on Emerging Technologies," Umberto Garlando, Politecnico di Torino (2nd place), and "SETA: A CAD tool for Single Event Transient Analysis and Mitigation on Flash-based FPGAs," S. Azimi, Politecnico di Torino (1st place).

## *DAPE Workshop in ECCE 2018*

IEEE Power Electronics Society and IEEE CEDA will hold the first "Design Automation for Power Electronics - DAPE" workshop on September 22, collocated with the IEEE Energy Conversion and Expo at the Oregon Convention Center, Portland, Oregon.

The purpose of this workshop is to understand the problems of Design Automation in Power Electronics, identify methodologies that have been used so far by academia and industry and identify the tools that have been developed to resolve the issues during design. The focus of the workshop is to bring together the experts in both Power Electronics and Design Automation and have them presenting their perspectives on the emerging needs.

The expected results are:

- A clear identification of the common ground and synergy between Power Electronics and Design Automation

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- An understanding where the limits of the current technology and tools are in Design Automation for Power Electronics
- A description of the needs for future work

DAPE has become of strategic importance for the Power Electronics Society as modern designs (especially in highly integrated systems) are dealing with multi-physics problems, shorter design time, and multivariable optimization to obtain higher efficiencies and more compact designs.

The workshop is organized as a single-track event with one morning and one afternoon technical lecture session. Both sessions will be followed by a panel discussion where the attendees will have an opportunity to engage directly with presenters. The event is free to register, through this link.

## *2018 SIGDA/CEDA PhD Forum: The Future Looks Bright*

This year's DAC PhD Forum was, for the first time, co-sponsored by CEDA along with the traditional sponsor, SIGDA. The event was held on Tuesday evening, June 26th, in San Francisco and featured poster presentations from the top Ph.D. students in EDA. This year, the PhD Forum Chair Prof. Sudeep Pasricha from Colorado State University oversaw a rigorous technical review process with the help of Co-Chairs Prof. Helen Li from Duke University and Prof. Umit Ogras from Arizona State University, and 36 technical program committee members from industry and academia. A total of 43 PhD Forum submissions from students across the globe were accepted for presentation at the event that was co-located with the DAC conference. These selected students not only got an opportunity to present and discuss their dissertation research with people in the EDA community, but were also provided with a grant to support their travel to the PhD Forum.

Over the past decade or so, the DAC PhD Forum has become one of the premier forums for PhD students in design automation to get feedback on their research and for industry to see academic work in progress. The event this year was sponsored by Cadence and attended by more than 400 students, professors, and industry professionals. A buffet dinner and drinks made for a festive atmosphere, as the PhD students, along with the co-located University Demo student participants and Richard Newton Young Fellows, presented their contributions for almost 3 hours. At the end of the evening, awards for the three top PhD Forum posters were announced (selected by a special committee made up of industry and academic professionals). If the enthusiasm, intelligence, energy, and liveliness of the participating PhD Forum students is any indication, the EDA industry can look forward to a talented pool of future computer engineers and scientists who promise to infuse the industry with their creativity and passion for design automation.

The winners of the 2018 SIGDA/CEDA PhD Forum were M. Xie from the University of Pittsburgh (3rd place), K. Moazzemi from the University of California, Irvine (2nd place), S. Angizi from the University of Central Florida (1st place).

## *Papers in* IEEE Embedded Systems Letters

The top-five accessed articles from *IEEE Embedded Systems Letters* in June 2018 were as follows:

- "A Taxonomy of General Purpose Approximate Computing Techniques," by T. Moreau *et al.*
- "A Novel Heterogeneous Approximate Multiplier for Low Power and High Performance," by I. Alouani, H. Ahangari, O. Ozturk, and S. Niar
- "Multipliers With Approximate 4–2 Compressors and Error Recovery Modules," by M. Ha and S. Lee
- "Using Approximate Computing for the Calculation of Inverse Matrix p th Roots," by M. Lass, T. D. Kühne, and C. Plessl
- "SVM-Based Dynamic Voltage Prediction for Online Thermally Constrained Task Scheduling in 3-D Multicore Processors," by C.-H. Liao and C. H. -P. Wen

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