Report on the 2017 International Conference on Computer-Aided Design (ICCAD)

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The 2017 IEEE/ACM International Conference on Computer-Aided Design (ICCAD) concluded successfully on 16 November 2017. The conference was held at the Marriott Hotel, Irvine, CA, USA, thus returning to California after a couple of years in Austin, TX, USA. An interesting and varied program focused primarily on electronic design automation (EDA) was presented to an enthusiastic audience of over 400 participants from several regions of the world covering over 25 countries.

The 36th edition of ICCAD started on 13 November 2017. The conference had two well-attended keynotes from researchers in industry and academia. The first keynote was delivered by Dr. Krysta Svore from Microsoft Corporation on the first day of the conference. Titled “Quantum Computing: Revolutionizing Computation Through Quantum Mechanics,” this keynote opened the conference program. She delivered a beautifully crafted talk replete with figures, clarifying complex concepts with simplicity. This talk on the disruptive and revolutionary technology had the audience spellbound, and Dr. Svore explained how the quantum technology will transform our digital age in the future. She energized the audience and likely motivated many to contemplate new EDA-oriented research in quantum computing. The third day of the conference saw the second keynote, which was well delivered by Prof. Todd Austin of the University of Michigan. His talk entitled “How EDA Could Save the World (of Computing),” was closer to the research area of many of the attendees. Prof. Austin persuasively made the case for the necessity of cheaper methods to bring designs to market rather than how these designs are actually created. He suggested a 100x reduction in design costs was necessary and proceeded to outline how this could be achieved. He showed five new research directions that could realize these efficiencies. Prof. Austin’s talk was delivered to a room that was overflowing and intrigued and challenged the notions of many researchers. Both the keynotes were a great success and a number of attendees continued to talk about these keynotes long after they had concluded.

The conference received nearly 400 submissions for the 124-member technical program committee (TPC) to review. Submissions were divided into 17 separate tracks where each TPC member reviewed papers only within a single track. The TPC sought four reviews per paper. Strict conflict of interest rules were applied. Final acceptance decisions were made during an in-person meeting with all TPC members, which took place in Austin, TX, USA, in June. A total of 105 regular papers were accepted, with an acceptance rate of 26%. The conference complemented the regular papers with a number of special sessions and embedded tutorials.

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Two best papers were chosen from amongst the regular papers submitted to the conference, one for the best front-end research paper and the other for the best back-end research paper. A committee of eminent researchers read through the best paper nominations to arrive at a short list of best paper candidates and then the best papers were chosen after further scrutiny. The front-end award was given to the paper titled “COMBA: A Comprehensive Model-Based Analysis Framework for High-Level Synthesis of Real Applications,” by Jieru Zhao, Liang Feng, Wei Zhang, Sharad Sinha, and Bingsheng He. The back-end award went to the paper titled “SALT: Provably Good Routing Topology by a Novel Steiner Shallow-Light Tree Algorithm,” by Genjie Chen, Peishan Tu, Evangeline F. Y. Young. These awards are given in memory of William J. McCalla for his contributions to ICCAD and his technical work in EDA throughout his career.

The ten-year retrospective most influential paper award was given to the work judged to be the most influential on research and industrial practice in EDA over the 10 years since its original appearance at ICCAD. The paper titled “Lightweight Secure PUFs” by Mehrdad Majzoobi, Farinaz Koushanfar, and Miodrag Potkonjak won this award. ACM/SIGDA Pioneer award and the IEEE Council for Electronic Design Automation (CEDA) Ernest S. Kuh Early Career Award were presented to Mary J. Irwin and Ayse Coskun, respectively.

There were nine special sessions and two embedded tutorials which were part of the core program of the conference. These sessions covered a variety of emerging challenges and respectively were titled: “Cross-Layer Efforts for Combating Computationally Hard Problems”; “AI for CPS: Machine Learning for Intelligent and Secure Cyber-Physical Systems”; “3D Integration Beyond TSVs”; “Where Are the True Innovations and Potentials of IoT?”; “FPGA CAD: Emerging Challenges and Solutions”; “Automotive EDA: Constructing the Intersection of Silicon Valley and Motor City”; and, “HDSLs: Domain Specific Languages for Hardware and SoC Design.” The two embedded tutorials were titled: “Predictive Process Design Kit (PDK) to Accelerate Academic Research in VLSI Design and CAD” and “Critical Infrastructure Safety and Security – Challenges and Research Opportunities.”

Thursday, 16 November 2017, was a day reserved for workshops. There were six workshops offered this year at ICCAD, which was an increase from past years. The workshops covered a number of interesting topics and were attended by over 130 participants. These workshops were: “Hardware and Algorithms for Learning On-a-Chip (HALO)”; “International Workshop on Design Automation for Analog and Mixed-Signal Circuits”; “10th IEEE/ACM Workshop on Variability, Modeling, and Characterization (VMC)”; “Design Automation for Quantum Computers”; “EDA/ CAD in the IoT eHealth Era: From Devices to Architectures, Applications, and Data Analytics”; and “Workshop on Non-conventional Approaches to Hard Optimization (NAHO).” While all workshops had healthy attendance, the HALO workshop and the one on quantum computers had significant numbers of participants in particular.

Before the official start of the conference, there was an event at the University of California, Irvine (UCI) to honor Prof. Daniel Gajski, which was held at the UCI campus in conjunction with ICCAD. Prof. Daniel Gajski contributed significantly to EDA research for over 40 years and his former students, colleagues, and research collaborators were present to make this a most memorable event. The ACM SIGDA CADathlon also preceded the main conference on the 12th of November and had a number of enthusiastic participants from a number of universities from around the world. Other notable sessions included the ACM/SIGDA Student Research Competition, an additional talk by Alessandra Nardi of Cadence Design Systems, Inc., titled “EDA Megatrends: Enabling a Wide and Dynamic Range of Applications,” an address by the IEEE CEDA President-Elect David Atienza introducing CEDA to the audience, and the annual ACM/SIGDA Members meeting.

In 2018, the 37th edition of the ICCAD will take place in San Diego at the Hilton San Diego Resort & Spa from the 5th to the 9th of November. We do look forward to your participation at this event.

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