Looking Forward to the 2016 Theme Issues

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A key strength of *IEEE Micro* is its tradition of steering content via special issues with expert guest editors, and 2016 is going to be no different. We expect another great year, as we have a number of timely and relevant special issue themes lined up.

This issue covers near-data processing, with Rajeev Balasubramonian (University of Utah) and Boris Grot (University of Edinburgh) as guest editors. Near-data processing refers to abstractions and technologies that move computation closer to the data. New technologies, such as 3D stacking, and emerging workloads, such as in-memory databases, have revitalized earlier research on processing-in-memory to alleviate the bottleneck and high cost of data movement commonly seen in contemporary big-data workloads. This special issue includes two technical articles, along with a guest editorial and thought-provoking position statements from leading experts in the field. I wholeheartedly thank Rajeev and Boris for serving as guest editors of this interesting and timely theme issue. And I invite you to read their column for more information regarding the special theme articles included in this issue.

The March/April issue will feature selected articles from the Hot Chips conference held in August 2015. The Hot Chips special issue traditionally features some of the most exciting and advanced microprocessor designs and projects in industry and academia. Behnam Robatmili (Qualcomm Research) and Rajeevan Amirtharajah (University of California, Davis) are the guest editors for this special issue, and they are in the process of compiling an excellent selection of contributions.

In May/June, we have our traditional Top Picks special issue, which selects the most significant research papers in computer architecture based on novelty and potential for long-term impact. Dan Sorin (Duke University) and Milo Martin (Google) are the guest editors and chairs of the selection committee, which consists of 35 experts from academia and industry. They received 101 submissions, out of which they will select the top papers for inclusion in *IEEE Micro*. Top Picks has become a prestigious vehicle to recognize the most significant research papers of the past year in the field.

The July/August issue will feature both Hot Interconnects articles and Computer Architecture Research Directions (CARD) debates. The former will include some of the best papers on interconnect microarchitecture from the Hot Interconnects conference held in August 2015. Ada Gavrilovska (Georgia Tech) and Ryan Grant (Sandia National Laboratories) will be guest editors for this selection of papers. The issue will also feature debates from CARD, a workshop held in conjunction with the International Symposium on Computer Architecture (ISCA) in June 2015. The CARD concept is to set up mini-panels with three experts in the field, two as panelists and the third as a moderator. The purpose of the panel discussion is to debate the state of the field and discuss future directions. The organizers of the CARD workshop—Derek Chiou (University of Texas at Austin), Resit Sendag (University of Rhode Island), and Joshua J. Yi (Dechert)—are in the process of compiling transcripts of these CARD debates.

The September/October special issue will be devoted to security, with Mohit Tiwari (University of Texas at Austin) and Todd Austin (University of Michigan) as guest editors. Given our dependence on computers, coupled with the rise of cyberattacks on our digital information systems, it is imperative that we design computers to improve security. Design for security should be done concurrently with design for performance, cost, power and energy efficiency, and reliability—in fact, security is becoming an increasingly important design target. This special issue will cover various aspects of secure computer systems with a specific emphasis on how (micro)architecture can help improve the security of our computer systems.

Finally, the November/December issue will feature articles and contributions on the Internet of Things (IoT) and the role of microarchitecture. The guest editors for this special issue are Hyesoon Kim (Georgia Tech) and Vijay Janapa Reddi (University of Texas at Austin). The IoT revolution is happening at an unprecedented pace and has the potential to be transformative to society. New

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devices are emerging, with each device being smart (that is, there is some intelligence built into it) and interconnected with each other and the Internet (a.k.a. the cloud). The special issue will focus on various technological advances in hardware and software to make the IoT revolution happen.

Next to special issues, *IEEE Micro* also features series of articles on a specific topic. One such series is Harsh Chips, guest edited by Augusto Vega, Alper Buyuktosunoglu, and Pradip Bose, all from IBM Research. The current issue also includes two articles from the Harsh Chips series. Ioannis Sourdis and colleagues from Chalmers University propose a mixed fine-grained and coarse-grained reconfigurable chip multiprocessor to increase the availability of safety-critical embedded systems in the presence of hard errors. Amoghavarsha Suresh and John Sartori from the University of Minnesota present an approach to automated algorithmic error resilience based on outlier detection.

Furthermore, this issue contains another departmental contribution. Onur Mutlu and Rich Belgard introduce two retrospectives of the Test of Time Awards of the International Symposium on Microarchitecture (MICRO). The retrospectives are about the papers "Microprogrammed Implementation of a Single Chip Microprocessor" by Skip Stritter and Nick Tredennick and "Code Generation Schema for Modulo Scheduled Loops" by Bob Ramakrishna Rau, Michael S. Schlansker, and P.P. Tirumalai. Congratulations to the award winners, and I hope our readers will enjoy these retrospectives and testimonials as much as I did.

I also want to thank all of the anonymous reviewers who contributed to *IEEE Micro* in 2015. For a list of reviewers, please see www.computer.org/web/computingnow/2015-ieee-micro-reviewer-thanks.

Finally, I wish you and your family all the best for 2016, both professionally and personally! With that, I conclude, and I wish you happy reading of the first issue of 2016.

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