

## SIGARCH Annual Report

July 2018 – June 2019

### OVERVIEW

Our past two annual reports discussed the launching of several new initiatives to address each of the three components of our mission statement – technical exchange, talent development and recognition, and outreach. Over the last year, we solidified many of these initiatives and started some new ones, thanks to many volunteers from the broader community. The **Computer Architecture Today blog** and the **lightning student mentoring sessions at the ISCA conference** continued to make impact. The **SIGARCH/TCCA dissertation award** was inaugurated this year. **New activities towards making our community more diverse and inclusive have attracted attention across Computer Science.** In the coming year, which will be the last one for this executive committee (EC), we plan to mainly focus on a review of our conference portfolio, including strengthening bylaws and guidelines for them, and to ensure that all our efforts so far are sustainable. The rest of this report describes in more detail our key activities under the three components of our mission statement.

### TECHNICAL EXCHANGE

**(1) Meetings:** SIGARCH (co-)sponsors a strong portfolio of conferences, many of which co-host a variety of highly attended specialized workshops and tutorials on leading edge topics. We highlight below two conferences: ISCA, the premier conference for computer architecture (co-sponsored with IEEE-CS TCCA) and ASPLOS, the premier multidisciplinary systems conference that brings together architecture, programming languages, and operating systems (co-sponsored with SIGPLAN and SIGOPS).

The 45th ISCA was held in downtown Los Angeles in June 2018. For the second time in the last ten years, ISCA hosted the prestigious ACM Turing Lecture, this time by John Hennessy and David Patterson. ISCA'18 was also historic in marking the first time that a woman received the ACM/IEEE-CS Eckert-Mauchly award, the highest award in computer architecture. Susan Eggers received the award and gave an inspiring speech at the awards luncheon. ISCA'18 also proudly hosted for the first time ever a Bias Busting workshop, with complimentary registration to all attendees with sponsorship from Google. In addition, the conference featured six workshops, 13 tutorials, three keynotes, 18 technical paper sessions (with both record submissions of 378 papers and 64 accepted papers) and a conference panel. The credit for the success of ISCA 2018 goes to the record 794 attendees who came from all over the world to present and exchange research ideas, and to an equally passionate group of organizers and sponsors that resulted in over \$385K in sponsorship funds for the conference. With additional funding from SIGARCH, TCCA, and NSF, ISCA'18 provided an unprecedented amount of student travel grant support to a record 162 students.

ASPLOS'18 was held in Williamsburg VA in March 2018. The conference featured a strong technical program with 56 papers, 2 keynotes, and the return of the popular Wild and Crazy Ideas session, along with 8 workshops and 4 tutorials, with 413 attendees and a near-record 319 paper submissions. A highlight of this year was the co-located visioning Workshop on Interdisciplinary Research Challenges in Computer Systems, sponsored by NSF, which drew over 150 attendees and produced extensive discussions on the future research directions in the field.

**(2) Annual SIGARCH visioning workshops:** The visioning workshop program, driven by Luis Ceze, Joel Emer, and Karin Strauss, seeks to catalyze and enable innovative research within computer architecture, and between computer architecture and other areas. Video recordings of the talks from our last visioning workshop - Trends in Machine Learning - were professionally edited and are part of the ACM Digital Library and inaugurated the SIGARCH YouTube channel. For our next visioning workshop, we have already received a strong inter-disciplinary proposal and expect to receive more by the September deadline.

**(3) Reviewing the review process:** As mentioned in the previous report, discussion at the ISCA'16 business meeting led to the SIGARCH and TCCA ECs jointly appointing the "Reviewing Reviewing (R2)" committee. The committee was charged to undertake a review of the ISCA peer-review process to systematically identify shortcomings (if any) and propose changes (if needed).

In its first year, the committee conducted a comprehensive community survey to identify what currently does and does not work well. The results of the 621 responses were reported at the ISCA'17 business meeting. In the last year, based on the survey responses and an analysis of the best practices in other communities, the committee proposed a two year experiment to address the identified shortcomings of the review process. The SIGARCH and TCCA ECs communicated specific concerns and suggestions for this proposal, which the committee incorporated in a revision presented for vote. The SIGARCH EC unanimously approved the proposal, but the TCCA EC vote was a tie and the proposal was not approved.

David Wood, a member of the R2 committee had coincidentally been elected earlier as program chair for ISCA'19 and had agreed to serve only if he could implement the R2 proposal. After the TCCA vote, Wood suggested a one year experiment based on R2 learnings for ISCA'19. A compromise agreed with representatives of the governing organizations of the four major architecture conferences was presented at the ISCA'18 business meeting. The poll at the meeting returned a majority in favor of the experiment, but continued opposition led Wood to conclude that the community was not yet ready to make a change and he declined to serve as ISCA'19 PC chair. ISCA'19 will therefore proceed with the current system.

The details of the R2 committee's work are available in a blog post and in a final report to be published shortly. The SIGARCH EC thanks all members of the R2 committee for their hard work: Natalie Enright Jerger, David Kaeli (co-chair), Christos Kozyrakis (co-chair), Gabriel Loh, Tom Wenisch, and David Wood. We particularly thank David Wood for going above and beyond the call of duty preparing multiple revisions to accommodate concerns raised.

**(4) Conference portfolio review:** We have started an initiative to review our conference portfolio to assess alignment with SIGARCH members' interests, to develop mechanisms to determine appropriate financial investments and accountability, and to develop rules and guidelines to be followed or considered by organizers of all SIGARCH (co-)sponsored conferences.

## TALENT DEVELOPMENT AND RECOGNITION

**(1) ACM/IEEE Eckert-Mauchly award:** This is the most prestigious award in computer architecture given for contributions to computer and digital systems architecture. The 2018 recipient was Susan Eggers for "outstanding contributions to simultaneous multithreaded processor architectures and multiprocessor sharing and coherency." Susan Eggers was the first woman to receive the award in its 39-year history.

**(2) SIGARCH Maurice Wilkes award:** This is the most prestigious award given to a researcher in the first 20 years of their career and went to Gabriel H. Loh for "outstanding contributions to the advancement of die-stacked architectures."

**(3) SIGARCH/TCCA influential ISCA paper award:** This award recognizes a paper from the ISCA 15 years earlier. The 2018 recipient was “Temperature-Aware Microarchitecture” by Kevin Skadron, Mircea R. Stan, Karthik Sankaranarayanan, Wei Huang, Sivakumar Velusamy, and David Tarjan.

**(4) ASPLOS influential paper award:** This award recognizes an ASPLOS paper from 10 or more years ago. The 2018 recipient was “OceanStore: an architecture for global-scale persistent storage” by John Kubiatowicz, David Bindel, Yan Chen, Steven Czerwinski, Patrick Eaton, Dennis Geels, Ramakrishna Gummadi, Sean Rhea, Hakim Weatherspoon, Westley Weimer, Chris Wells, and Ben Zhao from ASPLOS 2000.

**(5) SIGARCH Alan D. Berenbaum Distinguished Service Award:** This award is presented annually to an individual who has contributed important service to the computer architecture community. The 2018 recipient was Koen De Bosschere for “structuring and connecting the research community in computer architecture and compilation in Europe through the HiPEAC network.” May Berenbaum, the sister of Alan Berenbaum, presented the award to De Bosschere.

**(6) SIGARCH/TCCA outstanding dissertation award:** This award is presented annually to recognize excellent thesis research by doctoral candidates in the field of computer architecture. 2018 was the inaugural year for this award. The 2018 recipient was Aasheesh Kolli from the University of Michigan (advised by Thomas Wenisch) for his dissertation entitled “Architecting Persistent Memory Systems.” The award citation was “For contributions to the semantics and implementation of programming models for persistent memory systems.” Two honorable mentions were also presented: Matt Sinclair from the University of Illinois Urbana-Champaign (advised by Sarita Adve) for his dissertation entitled “Efficient Coherence and Consistency for Specialized Memory Hierarchies,” and Yuhao Zhu from University of Texas at Austin (advised by Vijay Reddi) for his dissertation entitled “Energy-Efficient Mobile Web Computing.”

**(7) Honoring recently retired and deceased members:** Jointly with TCCA, we launched a program in 2017 to honor at ISCA the contributions of members of our community who have recently retired or passed away. In 2018, we honored the retirement of Jim Goodman, Professor Emeritus from the University of Wisconsin and 2013 Eckert-Mauchly recipient. We mourned the passing of Burton J. Smith, the 1991 Eckert-Mauchly winner. Doug Carmean of Microsoft provided a tribute to Burton Smith at the awards lunch. We also mourned the loss of Nathan Binkert who served as SIGARCH information director from 2008 to 2011. Tribute to both of these architects was also paid on the Computer Architecture Today blog.

**(8) Travel and child care grants:** Like past years, student travel grants for conferences continued to be one of our flagship benefits for student members. SIGARCH supported many conferences last year with student travel grants (all conferences where SIGARCH co-sponsors at a level greater than 33% were eligible for student travel grant), but we had particularly significant travel grant programs for ISCA and ASPLOS. We also continued to support grants for childcare and disability support. These were programs that SIGARCH pioneered, and are continuing to gain momentum and are being adopted by others such as IEEE TCCA.

**(9) Lightning mentoring sessions:** At ISCA’18, we continued our “Meet a Senior Architect” mentoring program under the leadership of Joel Emer. The program matches students with mentors (through questions asked in the conference registration form), providing students the opportunity to meet 1-on-1 with a senior architect for about half an hour at the conference. Starting with 17 mentors and 33 students in 2016, this year the program attracted about 100 mentors and 145 students (including 39 as new SIGARCH members). The responses to past surveys indicate the program is a highlight for many students; e.g., “most valuable experience I had at a conference; I am 10 times more excited about ISCA now; makes approaching senior members far less intimidating; etc.

**(10) Women In Computer Architecture (WICArch):** This year, we formally added WICArch as a subcommittee of SIGARCH with the goal of centralizing all of our diversity efforts. The subcommittee makes recommendations to the EC on diversity initiatives and related budgetary matters. SIGARCH EC member, Natalie Enright Jerger, chairs the subcommittee. WICArch launched several new initiatives this year to build a community of female architects and celebrate their accomplishments. These efforts include: 1) a new mailing list provided by ACM to which all female members of SIGARCH and SIGMICRO are automatically subscribed; 2) a new social media presence on Facebook and Twitter (managed by Natalie Enright Jerger); 3) a new website and 4) a new mentoring program using slack. Our new website features a searchable directory of women architects; currently there are 60 women listed in the directory. We are doing additional outreach to increase the directory size. The goal of this directory is to provide more visibility for women that we hope will lead to more technically prestigious roles such as keynote speakers and program chairs. A more detailed summary of these activities can be found in a recent blog post.

**(11) Creating an inclusive and diverse community:** Over the last year, the architecture community has mobilized through a broad range of activities to make diversity and inclusiveness central tenets of all our endeavors. SIGARCH has played a key role in this process. The SIGARCH blog, Computer Architecture Today, served as an invaluable digital meeting space to expose problems, promote solutions, and provide a voice for the community to express itself on these issues. SIGARCH formed CARES, a committee to aid reporting of sexual harassment at SIGARCH events in consultation with ACM. Official recognition by ACM enabled SIGMICRO to join SIGARCH CARES in March. The program has since been emulated by other communities and also influenced ACM's new harassment policy. Margaret Martonosi and Kathryn McKinley are the co-chairs of the first CARES committee. CARES members provided support at ASPLOS'18 and ISCA'18. The work of the architecture community has attracted attention broadly across Computer Science. The SIGARCH chair gave presentations summarizing this work (not all of which came through SIGARCH) at the ACM SGB meeting and at a CRA Snowbird conference panel. These presentations and a summary of the above activities, including pointers to various blog posts, appear here: <http://bit.ly/inclusive-arch>

**(12) CACM Research Highlights:** SIGARCH has a standing committee of four persons to select papers to nominate as CACM Research Highlights. We solicit candidate papers from the Program Chairs of the most prestigious conferences sponsored by SIGARCH. Guidelines are provided including a survey of conference attendees. The committee evaluates the candidate papers, original reviews provided by the Program Chair, and the audience survey results to make their final determination. These candidates are then forwarded to the CACM Editorial Board to make the final decision. This year, we caught up on past backlog and made five nominations. The CACM editorial board has accepted three papers and one is still under consideration. We also now formally recognize nominated papers on the SIGARCH website to reflect the high prestige of being selected.

## OUTREACH

**(1) Computer Architecture Today Blog:** CAT has emerged as a successful platform for our community members and those in related fields to discuss diverse topics of interest, thanks to the dedicated efforts of the blog editor Alvin Lebeck with the help of the newly joined associate blog editor, Vijay Reddi. Since March 2017 CAT has had contributions with a cadence of roughly six postings a month covering topics as diverse as technological trends in computing and their implications for computer architects to topics related to conference health and review processes to inclusiveness and diversity in our field. Some posts have also been published in the CRA's Computing Community Consortium (CCC) blog for wider exposure.

**(2) Other communications and outreach:** In addition to updates to the website and newsletter (Boris Grot) and social media (Adrian Sampson), SIGARCH has now also launched a YouTube! channel created

by Karin Strauss with its debut hosting the first visioning workshop videos. As of this year, Reetu Das has taken over as the SIGARCH video editor maintaining the YouTube! channel which hosted the ISCA 2018 lightning talks. Boris Grot and his team have also launched the iscaconf.org website with a history of past ISCA conferences and their web content (when available) and information about the organizers.

## **VOLUNTEER DEVELOPMENT PROCESS**

We do not have a formal volunteer development process except to have the executive committee lead by example through its hard work. The community remains enthusiastic and we have been fortunate to be able to attract volunteers as needed, ranging from graduate students to senior researchers.

## **SUMMARY**

SIGARCH remains a financially healthy and vibrant organization with a broad and enthusiastic membership and committed leadership. In the previous years, we restructured the EC as a working committee with each EC member leading at least one project and all members meeting at a monthly teleconference. This restructuring and the enthusiastic support of the broader community has enabled us to launch and implement several new programs successfully over the last three years. We also gratefully acknowledge the ACM staff, notably Ashley Cozzi, for their support and for graciously handling the increased workload.

Respectfully submitted,

Sarita Adve, Chair

On behalf of the SIGARCH Executive Committee

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