SIGARCH Annual Report

July 2018 – June 2019

The last year concluded the term of the current executive committee. We published a retrospective on our activities here. The following describes our key activities over the last year under the three components of our mission statement. Most notable of these are: the work of the CARES committee, which has now been emulated by SIGGRAPH CARES and SIGCOMM CARES with plans for SIGPLAN CARES in the works; the continued success of the Computer Architecture Today blog which also served as the inspiration for the recently released SIGPLAN blog; the growing "Meet a Senior Architect" mentoring program; and the growing portfolio of activities of the Women in Computer Architecture (WICARCH) committee.

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 46th ISCA was held in Phoenix in June 2019 as part of the Federated Computing Research Conferences (FCRC). Being part of FCRC fostered inter-disciplinary interactions by providing attendees with the opportunity to interact with 12 other conferences and attend a broad set of FCRC-wide keynotes (including the Turing lecture). Of special note are collaborative efforts of the ISCA organizing committee with PLDI on the undergraduate workshop (see below) and reception attendance.

ISCA featured 28 workshops and tutorials in addition to the regular paper sessions and a panel. There were 821 total attendees with 561 attendees for workshops and tutorials and 660 attendees for the main conference. , The regular sessions had 365 submitted papers (with 1100 authors) and 62 accepted papers, all reviewed by 224 reviewers writing 1654 reviews. The conference committee raised $224,200 for the conference through various sponsorships. Each paper at the conference was provided three means of presentation: a 20-minute talk, a poster, and a brief Youtube video in lieu of lightning talks.

The organizing committee put a strong emphasis on diversity from under-represented groups. ISCA'19 hosted the first ever undergraduate workshop with full funding for 37 students representing 26 colleges and universities with 24 of the attendees from underrepresented groups. 126 (or ~19%) of main conference attendees identified as female.

ASPLOS'19 was held in Providence, RI in March 2019. The conference featured a strong technical program with 74 papers, keynotes by Barbara Liskov (MIT) on multicore programming and Krysta Svore (Microsoft) on quantum computing, a Wild and Crazy Ideas session, along with 7 workshops and 11 tutorials, with 390 attendees and a record 351 paper submissions.

The conference awarded four best paper awards to the following:
(i) Boosted Race Trees for Low Energy Classification. Georgios Tzimpragos, Advait Madhavan, Dilip Vasudevan, Dmitri Strukov, Timothy Sherwood.
(ii) CheriABI: Enforcing Valid Pointer Provenance and Minimizing Pointer Privilege in the POSIX C Run-time Environment. Brooks Davis, Robert N. M. Watson, Alexander Richardson, Peter Neumann, Simon Moore, John Baldwin, David Chisnall, James Clarke, Khilan Gudka, Alexandre Joannou, Ben Laurie, A.

Theodore Markettos, Ed Maste, Edward Tomasz Napierala, Robert Norton, Michael Roe, Peter Sewell, Stacey Son, Jonathan Woodruff, Nathaniel Wesley Filardo.
(iii) A Case for Lease-Based, Utilitarian Resource Management on Mobile Devices. Yigong Hu, Suyi Liu, Peng Huang.
(iv) Wasabi: A Framework for Dynamically Analyzing Web Assembly. Daniel Lehmann, Michael Pradel

(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. This year we held the second workshop in the series: "Agile and Open Hardware Design for Next-Generation Computing" with a distinguished roster of speakers covering the compute stack, from academia, industry, and funding agencies. The next workshop will be on "Hybrid Biological Computer Systems" and offers the opportunity of exchange of ideas in an even more interdisciplinary and emerging research area. The deadline for proposals for the coming year is in September.

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 2019 recipient was Mark Hill for "contributions to memory consistency models and memory system design.**"**

(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 Onur Mutlu for "innovative contributions to efficient and secure DRAM systems."

(3) SIGARCH/TCCA influential ISCA paper award: This award recognizes a paper from the ISCA 15 years earlier. The 2019 recipient was "Transactional Memory Coherence and Consistency" by Lance Hammond, Vicky Wong, Mike Chen, Brian D. Carlstrom, John D. Davis, Ben Hertzberg, Manohar K. Prabhu, Honggo Wijaya, Christos Kozyrakis, and Kunle Olukotun.

(4) ASPLOS influential paper award: This award recognizes an ASPLOS paper from 10 or more years ago. The 2019 recipient was the ASPLOS 2000 paper "Hoard: A Scalable Memory Allocator for Multithreaded Applications" by Emery D. Berger, Kathryn S. McKinley, Robert D. Blumofe, and Paul Wilson. This was the first time that a paper with a female primary co-author won the award.

(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 2019 recipient was Margaret Martonosi for "outstanding leadership in recruiting, retaining, and advancing women and underrepresented minorities and raising awareness of the importance of diversity to the computer architecture community." Eileen Lach, Alan Berenbaum's partner, presented the award.

(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. The 2019 winner was Yu-Hsin Chen from MIT (advised by Vivienne Sze and Joel Emer) for his dissertation titled "Architecture Design for Highly Flexible and Energy-Efficient Deep Neural Network Accelerators." The award citation was: "for contributions to efficient and flexible dataflows and architectures for deep learning acceleration." An honorable mention award went to Alexandros Daglis from EPFL (advised by Babak Falsafi and Edouard Bugnion) for his dissertation titled "Network-Compute Co-Design for Distributed In-Memory Computing." The award citation was: "for contributions to network-centric server architecture for in-memory datacenter services."

(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 2019, we honored the retirement of David Wood, Sheldon B. Lubar Chair at the University of Wisconsin-Madison and SIGARCH chair from 2011-15. We mourned the passing of Huixiang Chen, PhD student at the University of Florida, and of Sudhakar Yalamanchili, Regents Professor and Joseph M. Pettit Professor at Georgia Tech.

(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). 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'19, 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 ~100 mentors and 182 students. The responses to past surveys indicate the program is a highlight for many students; e.g., "most valuable experience I had at a conference." We have used the conference registration form to find interested mentors and mentees and are now automating the process of mentor-mentee matching to enable easy replication of this program in other conferences and communities.

(10) Women In Computer Architecture (WICARCH): WICARCH was formed to build a community to support women computer architects. We made it an official subcommittee of SIGARCH in 2017 with the goal of centralizing all of our diversity and inclusion efforts, including making recommendations to the EC on diversity initiatives and related budgetary matters. EC member, Natalie Enright Jerger, chairs WICARCH. The WICARCH web site contains a directory of women in computer architecture which has now grown to about 100 women. The web site also hosts an ongoing series of featured profiles of women in architecture. The WICARCH Slack community reached 200 participants who support each other in ways ranging from providing mentoring and advice to sharing successes to advertising opportunities and more. A new initiative last year was the WICARCH YouTube channel which hosts a monthly webinar series featuring women architect speakers. Also new was the preparation of a brochure detailing profiles of women architects on the job market last year which was appreciated by many universities. Other communities are seeking to emulate WICARCH's activities.

(11) Creating a diverse and inclusive community and CARES: We continued to emphasize diversity and inclusion. Specifically the CARES committee, co-chaired by Margaret Martonosi and Kathryn McKinley, has done exemplary work and is being emulated by other communities (e.g., SIGCOMM, SIGGRAPH). The committee has put in place bylaws for its operation. Since 2018, CARES has covered the ASPLOS, ISCA, and MICRO conferences along with their PC meetings. The CARES annual report submitted to SIGARCH and SIGMICRO clearly shows the need for such a committee and its perception as a valued resource. At the same time, the report is sobering and highlights the need to expand the mandate of CARES. The current CARES mandate has been to provide support for issues related to ACM's policy on harassment, mostly focused on gender and racial/ethnic discrimination and sexual harassment. However, the report notes that on the basis of its experience over the last year, other forms of harassment and ethics violations covered by other ACM policies appear to be important and germane for CARES to cover. We have had discussions with ACM leadership to broaden the CARES mandate to cover such ethics policy violations and are encouraged that the new ACM diversity and inclusion council will be considering this.

There are other aspects of reporting policy violations to ACM that have been perceived as impeding reporting and we hope to work with ACM on these aspects in the future.

(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. Two papers were nominated for the 2018 conferences. All nominations are recognized on the awards page of the SIGARCH web site.

OUTREACH

(1) Computer Architecture Today Blog: The SIGARCH blog has become a valued resource and continues to attract posts on diverse topics related to computer architecture and its community. In the last year, the blog featured 48 posts and more than 80,000 page views. SIGPLAN recently announced its blog, inspired by the SIGARCH blog. Alvin Lebeck, the founding editor of the blog, recently stepped down. We thank him for his exemplary service to the architecture community and welcome Rajeev Balasubramonian, the new editor of the blog, with Vijay Reddi continuing to serve as our much valued associate editor.

(2) Other communications and outreach: Our web site and newsletter (Boris Grot), social media presence (Adrian Sampson), and YouTube! channel (Reetu Das) continued to thrive, thanks to our dedicated communications team.

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 four years. We also gratefully acknowledge the ACM staff, notably Ashley Cozzi, for their support and for graciously handling the increased workload. We look forward to the work of the new EC under the leadership of Babak Falsafi.

Respectfully submitted,
Sarita Adve, Chair
On behalf of the SIGARCH Executive Committee
    Joel Emer
    Babak Falsafi
    Natalie Enright Jerger
    Scott Mahlke
    Parthasarathy Ranganathan
    Karin Strauss
    David Wood