SIGARCH Annual Report

July 2021 – June 2022

OVERVIEW

Our previous 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. These three components have a strong emphasis on diversity and inclusion with initiatives that have impacted communities across ACM and beyond. Over the last year, we solidified many of these initiatives and started new ones, thanks to volunteers from the broader community. In the coming year, besides solidifying existing initiatives, we plan to focus on specific ones that help improve the health of our conferences, our community, as well as the publication and conference organization processes. Like diversity and inclusion, we hope that these initiatives transcend beyond SIGARCH and help improve other SIGs and the broader computing community.

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 48th ISCA was held virtually in June 2021 due to COVID. The conference featured ten workshops, 13 tutorials, three keynotes, an industry track session, 22 (two-lane) technical paper sessions (with a near record for both 428 submitted and 76 accepted papers), and six panels. ISCA 2021 was the second online edition of ISCA with 1,524 participants and $99,950 of sponsored funds, most of which were deferred for use from ISCA'20.

ASPLOS'21 was also held virtually in April 2021 due to COVID. The conference featured a strong technical program with 75 accepted papers and 398 paper submissions. The program included three keynotes, four workshops, and nine tutorials and had a total of 837 registered attendees.

(2) ISCA industrial track: ISCA 2021 featured the second edition of the Industry Track inaugurated in the prior year. The Industry Track received 19 submissions from eleven companies, of which five papers were accepted for presentation.

(3) Annual SIGARCH visioning workshops: The visioning workshops continued being suspended due to COVID because organizers would prefer in-person meetings. The next workshop, which is on Bio-inspired computing, is planned for 2023.

TALENT DEVELOPMENT & RECOGNITION

We have a number of awards that are given annually either by ACM/IEEE directly, by SIGARCH alone, or SIGARCH together with TCCA. José Martínez is our Awards Chair and coordinates the Maurice Wilkes and Alan Berenbaum awards. The Dissertation award has an alternating chair between a SIGARCH EC and a TCCA EC member every year. Natalie Enright Jerger coordinates the CACM

highlights. The influential paper awards are coordinated by the conference chairs together with the respective steering committees or SIGARCH/TCCA chairs.

(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 2021 recipient was Margaret Martonosi for "contributions to the design, modeling and verification of power-efficient computer architecture."

(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 Thomas Wenisch for "contributions to memory persistency and energy-efficient systems."

(3) SIGARCH/TCCA influential ISCA paper award: This award recognizes a paper from the ISCA 15 years earlier. The 2021 recipient was "Techniques for Multicore Thermal Management: Classification and New Exploration" by James Donald and Margaret Martonosi.

(4) ASPLOS influential paper award: This award recognizes ASPLOS papers from 10 or more years ago. The 2021 recipients were "A VLIW Architecture for a Trace Scheduling Compiler" by Robert P. Colwell, Robert P. Nix, John J. O'Donnell, David B. Papworth, Paul K. Rodman in ASPLOS 1987, "The Cache Performance and Optimizations of Blocked Algorithms" by Monica S. Lam, Edward E. Rothberg, Michael E. Wolf in ASPLOS' 1991, "Improving the Accuracy of Dynamic Branch Prediction Using Branch Correlation" by Shien-Tai Pan, Kimming So, Joseph T. Rahmeh in ASPLOS 1992, and "Value Locality and Load Value Prediction" by Mikko H. Lipasti, Christopher B. Wilkerson, John Paul Shen in ASPLOS 1996.

(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 2021 recipient was Per Stenström for "the creation and successful implementation of the TACO/HiPEAC journal-first review model, and for decades long exemplary service contributions to the field" Eileen Lach, Alan Berenbaum's partner, together with the SIGARCH chair announced the award at the online ceremony.

(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 2021 recipient was Dimitrios Skarlatos from UIUC (advised by Josep Torrellas), for his dissertation entitled "Rethinking Computer Architecture and Operating Systems Abstractions for Good & Evil." The award citation was "for contributions to redesigning the abstractions and interfaces that connect hardware and operating systems." Honorable mentions went to Yatin Manerkar from Princeton (advised by Margaret Martonosi) for his dissertation entitled "Progressive Automated Formal Verification of Memory Consistency in Parallel Processors," with the award citation for "developing scalable, sound, and all-program hardware verification methods that demonstrate the potential of progressive correctness verification from early-stage architectural design to late-stage implementation" and to Hyoukjun Kwon from Georgia Tech (advised by Tushar Krishna and Michael Pellauer) for the dissertation entitled "Data- and Communication-centric Approaches to Model and Design Flexible Deep Neural Network Accelerators," with the award citation for "developing mechanisms to quantify the relationship between deep neural network mappings, data reuse and communication flows for system design of flexible deep learning accelerators."

(7) CACM Research Highlights: SIGARCH has a four-member standing committee to nominate papers for CACM Research Highlights. The candidate papers are solicited through a survey of conference attendees as well as nominations by Program Chairs of the most prestigious conferences sponsored by SIGARCH. These candidates are then forwarded to the CACM Editorial Board to make the final decision. The nominated papers are also listed on the SIGARCH website to reflect the high prestige of the papers being selected. This past year, the committee received eight recommendations from conferences and will be proceeding to select the nominees in Fall 2022.

(8) Honoring retirees: Jointly with TCCA, we launched a program in 2017 to honor at ISCA the contributions of members of our community who are retiring or have recently retired. In 2021, we honored the contributions of Prof. Wen-Mei Hwu who retired from UIUC.

(9) Remembering recently departed members: With TCCA, we also launched a program at ISCA in 2017 to remember members of our community who have passed away. We mourned the passing of Vassos Soteriou, Associate Professor at Cyprus University of Technology. Prof. Yanos Sezeides of University of Cyprus provided a tribute at ISCA'21.

(10) Student mentoring: Joel Emer, our Mentorship Chair, continued the "Meet a Senior Architect" together with "Meet a Senior Student" in 2021 with CASA. The programs match students with mentors (through questions asked in the conference registration form), providing students the opportunity to meet 1-on-1 with a senior architect or a senior student for about half an hour at the conference. Starting with 17 mentors and 33 students in 2016 at ISCA with "Meet a Senior Architect", the two programs have now expanded into ISCA, ASPLOS and MICRO with ISCA having 55 mentors and 93 students, and ASPLOS having 142 mentors and 255 students.

(11) Women In Computer Architecture (WICArch): WICArch was created in 2018 as part of SIGARCH to build a community of female architects, celebrate their accomplishments, and boost talent development for women in architecture with Natalie Enright Jerger as the inaugural chair. WICArch has launched a number of initiatives including a webpage showcasing female architects and their profiles, a flyer widely publicizing women in computer architecture (and systems) for the academic recruiting season, a strong Slack community, and a monthly webinar series. WICArch created a Bylaws document in 2020 and launched an official election process in early 2022 for the positions of Chair, Vice Chair, and Executive Committee members. The incoming WICArch chair is Kelly Shaw.

(12) Computer Architecture Student Association (CASA): CASA is an independent student-run organization with the express purpose of developing and fostering a positive and inviting student community within computer architecture. CASA is now run by a steering committee of 13 members. SIGARCH has been co-sponsoring CASA together with IEEE TCCA with funds for activities aligned with its mission. SIGARCH also hosts CASA on the sigarch.org website. In 2021, we funded CASA for the Promotion of Balanced Mental Health for Graduate Students event. CASA also ran the "Meet a Senior Student" together with SIGARCH's "Meet a Senior Architect" at our conferences this past year.

OUTREACH

(1) Computer Architecture Podcasts: Boris Grot, our Communication's Team chair launched the Computer Architecture Podcasts in 2020 with Lisa Hsu and Suvinay Subramanian as the editors to interview leading figures in the architecture community about cutting-edge topics in architecture, their vision, and career experiences. The podcasts are available in standard formats and are hosted at

comparchpodcast.podbean.com. In 2021 there were a total of three podcasts with Mark Hill of Microsoft, Christina Delimetrou of Cornell, and Fred Chong of U. Chicago. The podcasts have enjoyed 7500 downloads, a 70% increase in 2021 as compared to prior year.

(2) Computer Architecture Today (CAT): In 2021, CAT continued serving as a successful platform for our community members and those in related fields to discuss diverse topics of interest, thanks to its blog editor, Rajeev Balasubramonian, with the help of the associate blog editor, Christian Delimetrou. This year the blog featured 45 articles with over 90,000 views.

(3) Communication Team: Our Communication Team under Boris Grot's leadership as the chair, together with Samira Khan as the content editor (for the website, announcements, and the newsletter) and Jayneel Gandhi as the video editor in charge of the SIGARCH YouTube! channel. The YouTube! channel has continued to serve as a platform to host all recordings for the virtual/hybrid conferences, starting with ASPLOS'20. We welcome Akanksha Jain as the new content editor in 2022 and thank Samira for her outstanding service. Adrian Sampson remains the social media editor.

GRANTS & SUPPORT PROGRAMS

We have a number of grants and support programs that are coordinated and managed by our Treasurer, Karin Strauss. These include:

(1) Talent development grants: We have launched financial support for initiatives aimed at developing talent, improving well-being, and advancing diversity and inclusion for the computer architecture community. The Undergrad Architecture Mentoring Workshop (Uarch) was inaugurated at ISCA'19 and targeted boosting participation from undergrads in parts of the world and institutions with lower average participation at computer architecture conferences. In 2021, the workshop was held at ISCA and funded 115 students from all over the world including 7% from Africa, 8% from Europe, 15% from Middle East, 33% from North America and 37% from Asia (besides Middle East).

(2) Student travel grants: Student travel grant for conferences is among our flagship benefits for student members. All conferences where SIGARCH co-sponsors at a level greater than 33% are eligible for student travel grant support at levels of $5K-$20K. Survey results in 2016 indicated that 39% of the respondents said they would come to ISCA only if they received some travel grant and 5% of the students used personal funds to cover the difference between actual costs and these travel grants. In 2021, we continued supporting our student members through the travel grants at sponsored conferences.

(3) Diversity and inclusion grants: SIGARCH provides financial support for a number of initiatives aimed at developing talent, improving well-being, and advancing diversity and inclusion for our members at various levels of seniority at SIGARCH-sponsored events. In 2021, we financially sponsored CASA's Promotion of Balanced Mental Health event for Graduate Students, the Undergrad Architecture Mentoring Workshop (Uarch), Young Architect Workshop (Yarch), and the grad cohort of CRA Committee on Widening Participation in Computing Research (CRA-WP).

(4) Companion assistance and childcare grants: SIGARCH was a pioneer in supporting travel grants for companions for childcare or disability support for those attending professional meetings while

traveling. These have expanded to supporting on-site childcare. We are pleased to continue seeing an increase in applications for these grants as well as to see IEEE TCCA supporting its own similar program.

GUIDELINES & RESOURCES FOR ORGANIZERS

The troubling events in the community in the past three years with respect to violations of code ethics and publication procedures have revealed areas where our policies and processes can be improved to deter and prevent misconduct, promptly detect and investigate it when it happens, and enforce penalties on the perpetrators. Unfortunately, with this announcement, many questions remain unanswered regarding our policies and processes. In 2021, we outlined a few of these questions in a Computer Architecture Today blog. We are glad to see that ACM is taking steps in addressing some of these concerns. We are also glad to see that other SIGs are following a few of our guidelines for conference organizers to vet team members against ACM's sanctions database.

Starting in 2020 we reported a number of initiatives including extending CARES' mandate to cover aid with reporting violations of publication and review policies and code of ethics, announcing clear ethics guidelines to all program committee members at ISCA and ASPLOS, and tightening security and activity tracking in HotCRP. In 2021, in addition we have accomplished the following:

(1) Best practices for conference reviewing: In 2021, Boris Grot and José Martínez of SIGARCH (together with Daniel Jiménez and Moin Qureshi for TCCA) published a best-practices document for anonymity, conflict of interest, and ethics guidelines for program committee chairs, authors and reviewers which was the result of two years of work and included integrated feedback form the community. The document will hopefully inspire other SIGS to adopt similar best practices as they see fit.

(2) Best practices for program chairs. In 2021, the SIGARCH/TCCA team started updating the best-practices document for program chairs which was originally drafted in 2013 for ISCA. The new document includes guidelines for vetting the invited list of reviewers against the ACM and IEEE's sanctions database and by the conference Steering Committee. This document is recommended for all SIGARCH- and TCCA-sponsored conferences and can hopefully serve as a boilerplate for other SIGs.

(3) Program chair/General chair packets: In recent years, the combined effect of growth in the community, increase in the number of initiatives we have launched in SIGARCH for the community, and transformation of conferences from in-person to online and hybrid has resulted in unprecedented load on conference organizers and program chairs. Under Martha Kim's leadership and together with TCCA, we started working on packets for program chairs and general chairs with guidelines and pointers to information, resources and tools. We also continue updating the Architecture PCDB, a database of service history from reviewers in four computer architecture conferences, as well as, IEEE Micro Top Picks, which is available on the SIGARCH website. The webpage tracks the history of service by a reviewer as a main or external program committee member.

(4) ConflictDB: One of the key concerns for conferences in our community is the increase in the number of submitted papers and review load. Program chairs are now running main program committees of 100 members with over 400 papers submitted. The PC Chair guidelines packet includes pointers to open-source tools for use by organizers to crawl DBLP and identify conflicts. Self-declared conflicts, conflicts not evident through DBLP because of new collaborations, or other forms of conflicts that may need to be considered as outlined in the Best Practices for Conference Reviewing document still require a

manual check which is prohibitive given the number of papers, authors, and reviewers involved. In 2020, we launched the development of ConflictDB that enables tracking both DBLP-crawled and self-declared conflicts (through two-way confirmation) for use by the community across multiple computer architecture conferences and it will be piloted in Fall 2022. We are also in touch with ACM to make this platform available to other SIGs.

(5) Guidelines for sponsored and in-cooperation conferences: In 2021, Martha Kim led the creation of a new set of guidelines reflecting SIGARCH's minimum standards for sponsored and in-cooperation conferences to follow. The new requirements include (but are not limited to) posting ACM's Code of Ethics and Professional Conduct and ACM's Policy Against Harassment on the conference website, prompt reporting of alleged violations of these codes, using double-blind review processes for paper selection, considering ACM's guidelines for forming a diverse team for organization and reviewing, and vetting the team against ACM's sanctions database.

SUMMARY

SIGARCH remains a financially healthy and vibrant organization while increasing the scope of its initiatives to sponsor activities for technical exchange, talent development, and recognition, outreach, and grants/support programs with a strong emphasis on diversity and inclusion. It takes a village to launch and deliver on these initiatives. We would not be able to realize our vision without the dedication of a large number of volunteers in various committees. We gratefully acknowledge the ACM staff, notably our liaison J. C. Peeples, for their support and for graciously handling the increased workload.

Respectfully submitted,

Babak Falsafi, Chair

On behalf of the SIGARCH Executive Committee
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