

SIGARCH Annual Report

July 2011 - June 2012

Overview

The primary mission of SIGARCH continues to be the forum where researchers and practitioners of computer architecture can exchange ideas. SIGARCH sponsors or cosponsors the premier conferences in the field as well as a number of workshops. It publishes a quarterly newsletter and the proceedings of several conferences. It is financially strong with a fund balance of over two million dollars. The SIGARCH bylaws are available online at http://www.acm.org/sigs/bylaws/arch_bylaws.html.

Officers and Directors

During the past fiscal year David Wood served as SIGARCH Chair, Sarita Adve served as Vice Chair, and Partha Ranganathan served as Secretary/Treasurer. Norm Jouppi, Kai Li, Scott Mahlke, and Per Stenstrom served on the Board of Directors, and Doug Burger also served as Past Chair. In addition to these elected positions, there are three appointed positions. Doug DeGroot continues to serve as the Editor of the SIGARCH newsletter Computer Architecture News. Kevin Lim replaced Nathan Binkert as the SIGARCH Information Director, providing SIGARCH information online. Rob Schreiber served as SIGARCH's liaison on the SC conference steering committee until May, then stepped down and was replaced by Mattan Erez.

Awards

The Eckert-Mauchly Award, cosponsored by the IEEE Computer Society, is the most prestigious award in computer architecture. SIGARCH endows its half of the award, which is presented annually at the Awards Banquet of ISCA. Algirdas Avizienis of the University of California, Los Angeles received the award in 2012, for "For fundamental contributions to fault-tolerant computer architecture and computer arithmetic." In 2009, SIGARCH petitioned ACM to increase the ACM share of the award to \$10,000, using an endowment taken from the SIGARCH fund balance, which ACM has approved. The increase will happen when IEEE approves a matching increase, which will increase the amount of the award to \$20,000.

SIGARCH has endowed the Maurice Wilkes Award, an award established to recognize computer architects early in their careers, named after one of the pioneers of computer architecture who began making significant contributions early in his career. The award is selected by a vote of the Executive Committee and Board of SIGARCH, from a list of nominees supplied by a three person nominating committee. Due to a potential conflict of interest, the nominating committee was expanded this year from three to five. The 2012 award went to David Brooks of Harvard University, for "For outstanding contributions to power modeling, circuit and microarchitectural techniques to improve energy efficiency."

SIGARCH also cosponsors, along with the IEEE-CS TCCA, the Influential ISCA Paper Award which is presented annually at the ISCA conference. This award recognizes the paper, presented at the ISCA conference 15 years previously, which has had the most impact on computer architecture. The eighth Influential ISCA Paper Award was presented to Subbarao Palacharla, Norman P. Jouppi, and James E. Smith for their paper " Complexity-Effective Superscalar Processors " which appeared in the proceedings of the 23rd ISCA (1997).

In 2009, SIGARCH and the ASPLOS co-sponsors (SIGPLAN and SIGOPS) approved the creation of an ASPLOS Best Paper Award, the first one of which was awarded in 2009. The Award is determined by a vote of the Program Committee, and announced at the conference. In 2012, the fourth ASPLOS Best Paper Award was awarded to Michael Ferdman, Almutaz Adileh, Onur Kocberber, Stavros Volos, Mohammad Alisafae, Djordje Jevdjic, Cansu Kaynak, Adrian Popescu, Anastasia Ailamaki, and Babak Falsafi for their

paper “Clearing the Clouds: A Study of Emerging Workloads on Modern Hardware”.

Starting in 2011, ASPLOS began awarding an “Influential Paper Award,” modeled after the award presented at ISCA. The ASPLOS Influential Paper Award is awarded to any paper published in ASPLOS conferences ten or more conferences prior to the conference in which the award is being made. Unfortunately, due to a lack of oversight, the organizing committee for ASPLOS 2012 failed to select a recipient for this award in 2012.

In 2007 the ACM Awards Committee approved the establishment of the SIGARCH Distinguished Service Award, for “important service to the Computer Architecture community.” Nominations are due each year by February 15th, and can be sent to the SIGARCH Secretary/Treasurer at any time. No award was given this year, but the committee expects to have several nominees next year that meet the selection criteria.

SIGARCH is a co-sponsor of the Ken Kennedy Award, founded in 2009. The ACM-IEEE CS Ken Kennedy Award is awarded annually and recognizes substantial contributions to programmability and productivity in computing and substantial community service or mentoring contributions. The award includes a \$5,000 honorarium and the award recipient will be announced at the SC Conference. The recipient will give a presentation, normally technical, at the SC conference at which it is announced, or at an ACM or IEEE conference of the winner's choosing during the year following the announcement. The 2011 recipient of the Ken Kennedy Award was Susan Graham, for “foundational compilation algorithms and programming tools; research and discipline leadership; and exceptional mentoring.”

Three of the above awards, the Eckert-Mauchly Award, the Maurice Wilkes Award, and the Influential ISCA Paper Award were presented at ISCA 2012 in Portland, OR.

New Areas and Programs

SIGARCH continues to broaden its definition of Computer Architecture to encompass both new technology challenges and new application areas. On the technology front, as Moore’s Law draws to a close decreasing transistor reliability is driving a resurgence in novel ideas to build dependable systems from unreliable components. Similarly, the end of Dennard Scaling, which enabled power to largely scale with transistor counts, has resulted in a plethora of novel solutions using heterogeneity and/or new instruction set architectures to achieve fundamental increases in energy efficiency. On the application front, new architectures have been proposed to fundamentally revisit how to provide software security and increase programmer productivity. Finally, the importance of energy efficiency—at all levels—is driving an increasing recognition of the commonalities between the mobile space and the data center.

To address these emerging areas, SIGARCH has sponsored tutorials and workshops in these emerging areas. ISCA 2012 included tutorials on workloads for the cloud, security, and power, as well as workshops on architectures for Big Data, energy efficiency and Dark Silicon.

Innovative Programs

SIGARCH was one of the 11 SIGs to sponsor the ACM Turing Centenary celebration, providing \$22,800 to support this very successful and highly-visible event. As part of this support, SIGARCH selected 7 computer architecture students to receive student scholarships to attend the celebration.

SIGARCH supports child care and companion support travel programs to conferences, although participation since approval of these programs has been low. Reimbursement for child care is capped at \$1000 per conference. SIGARCH has also formalized funding levels for its student travel grant program, and now provides a level of support to all conferences that SIGARCH sponsors at a 33% level or higher, which previously was only provided to the ISCA and ASPLOS conferences. SIGARCH awarded a total of \$80K in student travel across all conferences in 2012.

In 2012, SIGARCH also provided \$2,000 in support for the CRA-W/CDC Computer Architecture Mentoring Workshop which targets increasing participation by women and under-represented minorities.

Travel Grants

SIGARCH has regularly supported student travel grants to its flagship conferences, ISCA and ASPLOS, but starting from 2011, SIGARCH broadened this program to other SIGARCH-sponsored conferences. The allocation to each conference is based on SIGARCH revenues and the percentage sponsorship of the conference and is set by dividing the travel grant budget by number of attendees, giving an extra 33% allocation to international conferences, and a small additional budget (~10%) to ISCA as the flagship conference. The grants are restricted to student members of SIGARCH, following several votes of the SIGARCH membership. (But the travel grant administrators are encouraged to highlight the cheap SIGARCH online membership option available for students.) For FY2012, SIGARCH budgeted \$80,000 for travel grants. For ISCA 2012, SIGARCH funding for student travel was also supplemented by sponsorship from NSF, Google, and IEEE TCCA. 122 students were funded by the ISCA student travel grant, of which 65 of those were recipients of SIGARCH funding. Overall, ISCA had a record student attendance with 259 students accounting for the total 619 attendees. SIGARCH plans to continue to emphasize and support student participation in SIGARCH-sponsored conferences going forward as well. SIGARCH also supports a companion travel grant program for SIGARCH members who are either (1) a person with a physical disability necessitating a companion, or (2) a parent of an infant less than one year old who cannot travel without the infant and a care-provider for the infant. But we did not have occasion to disburse funds for this program in FY12.

Conferences

SIGARCH is a 50% cosponsor of ISCA, the International Symposium on Computer Architecture, which is the premier conference in the field of computer architecture. The 39th annual ISCA (ISCA 2012) was held in Portland, OR. Shih-Lien Lu was the General Chair, and Josep Torrellas was the Program Chair. ISCA 2012 received over \$96,000 in industrial donations to support the conference, plus an additional \$39,000 in support for student travel grants (\$20,000 of this from SIGARCH). ISCA 2013 will be held in Tel-Aviv, Israel, with Avi Mendelson as General Chair and Margaret Martonosi as Program Chair. Several cities are still under consideration for a domestic location for ISCA 2014.

The SC'XY Conference is jointly sponsored by SIGARCH and the IEEE Computer Society. Formerly known as the Supercomputing Conference, the conference has successfully evolved away from its focus on supercomputers and is now the High Performance Networking and Computing Conference. In addition to its technical success, SC'XY is large enough that it must be scheduled many years in advance. SC 2011 was held in Seattle, WA and SC 2012 will be held in Salt Lake City, UT. In Fall 2012, the ACM SGB with SIGARCH's support approved creation of the Special Interest Group in High-Performance Computing (SIGHPC). SIGARCH has since entered into an agreement with SIGHPC to transition sponsorship of SC'XY to SIGHPC, with SIGARCH remaining in-cooperation in the long term. Beginning with SC'12, any surpluses net of special projects will accrue to SIGHPC, to build up their fund balance. SIGHPC is also liable for any losses, with SIGARCH effectively acting as their banker in this event (i.e., in this hopefully rare case, SIGARCH will cover the loss, but SIGHPC will remain obligated to eventually repay SIGARCH).

SIGARCH is a cosponsor of the Conference on Architectural Support for Programming Languages and Operating Systems, commonly known as ASPLOS, along with SIGPLAN and SIGOPS. The conference had been held biannually since 1982, alternating its location between San Jose and Boston. Starting in 2008 the conference has been held annually. ASPLOS 2012 was held in London, UK, the first international venue, with Tim Harris serving as General Chair and Michael Scott serving as Program Chair. ASPLOS 2013 will be held in Houston, TX, with Vivek Sarkar serving as General Chair and Ras Bodik serving as Program Chair.

SIGARCH sponsors the International Conference on Supercomputing (ICS). ICS 2012 was held in Venice, Italy. Kyle Gallivan and Utpal Banerjee were General Co-Chairs and Gianfranco Bilardi and Manolis Katevenis were Program Co-Chairs. ICS 2013 will be held in Portland, OR. Allen Maloney will be General Chair and Sam Midkiff and Mario Nemirovsky will be Program Co-Chairs.

The nineteenth Symposium on Parallel Algorithms and Architectures (SPAA 2012), jointly sponsored by SIGARCH and SIGACT, was held in Pittsburgh, PA. The General Chair was Guy Blelloch, and the Program Chair was Maurice Herlihy. SPAA 2013 will be held in Pittsburgh, with Guy Blelloch as General Chair.

SIGARCH is one-half co-sponsor of the IEEE/ACM International Conference on Grid Computing. Grid 2011 was held in Lyon, France, with Nils Gentschen Felde as General Chair and Shantenu Jha as Program Chair. Grid 2012 will be held in Beijing, China, with Dieter Kranzmueller and Weimin Zheng as General Co-Chairs and Rajkumar Buyya and Hai Jin as Program Co-Chairs.

SIGARCH is one-half cosponsor of the International Symposium on High Performance Distributed Computing. HPDC 2012 was held in Delft, The Netherlands, with Dick Epema as General Chair and Thilo Kielmann and Matei Ripeanu as Program Co-Chairs. HPDC 2013 will be held in New York City, NY, with Manish Parashar and Jon Weissman as General Co-Chairs and Renato Figueiredo and Dick Epema as Program Co-Chairs.

SIGARCH is one-third cosponsor of the Conference on Parallel Architectures and Compiler Techniques (PACT), along with the IEEE Computer Society and IFIP, and annually held in the fall. PACT 2011 was held in Galveston, Texas, with Laurence Rauchwerger as General Chair and Vivek Sarkar as Program Chair. PACT 2012 will be held in Minneapolis, MN with Pen-Chung Yew and Sangyeun Cho as General Co-Chairs and Luiz DeRose and David Lilja as Program Co-Chairs.

SIGARCH is one-fourth co-sponsor of the Symposium on Architectures for Networking and Communications Systems (ANCS). ANCS 2011 was held in Brooklyn, NY, with H. Jonathan Chao as General Chair and Jose Duato and Tilman Wolf as Program Co-Chairs. ANCS 2012 will be held in Austin, TX, with Tilman Wolf as General Chair and Andrew Moore and Vikto Prasanna as Program Co-Chairs.

In 2007 SIGARCH was a founding co-sponsor of the International Symposium on Networks-on-Chips (NOCS). NOCS 2012 was held in Lyngby, Denmark, co-located with The 18th IEEE International Symposium on Asynchronous Circuits and Systems ([ASYNC 2012](#)). Jens Sparsø and Jan Madsen were General Co-Chairs, and Diana Marculescu and Chita Das were Program Co-Chairs. NOCS 2013 will be held in Tempe, AZ, with Karam S. Chatha and Chita Das as General Co-Chairs and Natalie Enright Jerger and John Bainbridge as Program Co-Chairs.

SIGARCH also became a cosponsor of the International Conference on Autonomic Computing (ICAC) in 2007. ICAC 2011 was held in Karlsruhe, Germany, with Hartmut Schmeck and Wolfgang Rosenstiel as General Co-Chairs, and Tarek Abdelzaher and Joe Hellerstein as Program Co-Chairs. ICAC 2012 will be in San Jose, CA, with Dejan Milojevic as General Chair and Vanish Talwar and Dongyan Xu as Program Co-Chairs.

In addition to the above conferences, SIGARCH is co-sponsoring, or in cooperation with, several other conferences. SIGARCH has a sponsorship position in SenSys, a conference on Sensor Systems. In addition, SIGARCH has in-cooperation status with TCE, HotPar, HIPEAC, IPDPS, CoolChips, PAPA, and Nano-Net.

Publications

CAN (Computer Architecture News), SIGARCH's newsletter, is published 5 times a year. Of those five, the ISCA Proceedings form a special issue, and the ASPLOS Proceedings is likewise distributed as a special

issue. The regular issues of the newsletter consist of technical contributions, reports of panels, Internet nuggets (the most interesting or controversial articles from the comp.arch newsgroup), book reviews, and calls for papers. There are occasional single topic special issues based principally on workshops. Proceedings of SC, SPAA and ICS are available through the Member Plus program. In 2009, SIGARCH began offering a new electronic membership for regular members and students, at reduced cost with no proceedings mailed. Currently, more than half, 740, of SIGARCH's members have registered under the electronic membership option. Given the continuing shift to electronic memberships, the SIGARCH Executive Committee is exploring alternatives to revitalize, reform, or replace CAN.

Finances

SIGARCH enjoys a healthy fund balance that is currently larger than the \$1.7M fund balance required by the ACM for sponsorship of SIGARCH conferences for FY'12. The projected SIGARCH fund balance for FY'12 is \$3,002,207. Given prior large surpluses, SIGARCH and the SC Steering Committee have an agreement that some of the future profits from SC'XY will be in large part returned to the SC community, in the form of a series of project-oriented grants (to be matched by the other sponsor of SC'XY, the IEEE Computer Society). The grant amounts are capped by the average surplus over the first two of the previous three years. ISCA, SIGARCH's flagship conference, continues to be healthy and show attendance near the top of historical levels.

SIGARCH has been losing money on print-based subscriptions and breaks-even on online-digital subscriptions, but makes money on average from conferences. To address the loss on print-based subscriptions (SIGARCH was losing \$13 per professional print membership and \$23 per student print membership), in FY12, the membership for these categories were increased to breakeven. The online membership rates were not changed and continue to be \$6 and \$2 respectively.

SC Conference Grants

For SC'11, the SC leadership requested \$859,090, of which \$429,545 is SIGARCH's share, in funds for special projects related to the SC community. For SC'12, \$385,971 has been budgeted for SC special projects. As part of the transition plan, SIGARCH is responsible for ACM's share of the special projects budget for SC'12 and SC'13 and is responsible for a pro rata share with SIGHPC (based on relevant surpluses) for SC'14. SIGHPC will be fully responsible for ACM's share of special projects beginning with SC'15.

Membership

SIGARCH membership was declining gradually since 1999, dropping from its peak of 1452 in 2005 to 1344 in 2009, but has started to recover, increasing to 1426 as of Mar. 2012. SIGARCH's membership continues to shift to electronic-only membership, available at reduced cost, and is likely a factor in growing membership. Last year, more than half, 740, of SIGARCH's members chose electronic-only membership. Our changes to the membership fees may have a transient effect on membership, and we are monitoring this carefully as well as planning conservatively. ISCA, SIGARCH's flagship conference, continues to be healthy and show attendance near the top of historical levels.

Summary

SIGARCH remains a financially healthy institution with an enthusiastic membership. The interest of its members can be gauged by the health of all of its major conferences in the past year. The challenges remain as they have in previous years: how to better serve our members, how to encourage other members of the architecture community to join, how to help steer the community as the nature of our field changes, and how to use our fund balance most effectively.

Respectfully submitted,

David Wood, SIGARCH Chair

Doug Burger, SIGARCH Past Chair