

# SIGARCH Annual Report

## July 2012 - June 2013

### 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 a million dollars. The SIGARCH bylaws are available online at [http://www.acm.org/sigs/bylaws/arch\\_bylaws.html](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. 2013 was an election year for SIGARCH, but in accordance with SGB bylaws, the executive committee, by unanimous consent, requested that their terms be extended for an additional two years to maintain continuity, especially during the establishment of SIGHPC and the initial transition of SC'XY from SIGARCH to SIGHPC. 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 continues to serve as the SIGARCH Information Director, providing SIGARCH information online. Mattan Erez continues to serve as SIGARCH's liaison on the SC conference steering committee.

### 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. James Goodman of the University of Auckland and emeritus professor of the University of Wisconsin, Madison, received the award in 2013, for "*For pioneering contributions to the architecture of shared-memory multiprocessors.*" 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 2013 award went to Parthasarathy (Partha) Ranganathan of HP Labs "*For contributions to the design of power-efficient microblade servers and pioneering work in disaggregated system designs.*"

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 ninth Influential ISCA Paper Award was presented to Srilatha Manne, Artur Klauser, Dirk Grunwald, "*Pipeline Gating: Speculation Control for Energy Reduction,*" which appeared in the proceedings of the 24th ISCA (1998).

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 2013, the fifth ASPLOS Best Paper Award was awarded to two papers: *A Hardware/Software Testbed for Computational Sprinting*, Arun Raghavan, Laurel Emurian, Lei Shao, Marios Papaefthymiou, Kevin Pipe, Thomas Wenisch and Milo Martin and *Discerning the Dominant Out-of-Order Performance Advantage: is it Dynamism or Speculation?*, Daniel McFarlin, Charles Tucker and Craig Zilles.

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. No award was given in 2012. In 2013, the award was given to Ravi Rajwar and James R. Goodman, for “Transactional lock-free execution of lock-based programs,” which appeared in ASPLOS X, in 2002.

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 15<sup>th</sup>, and can be sent to the SIGARCH Secretary/Treasurer at any time. No award was given in 2012 due to a lack of nominations. In 2013, the award was given to Norman P. Jouppi, “For two-decades of dedicated service to SIGARCH and ACM.” The committee has also pro-actively identified several candidates that meet the selection criteria for future awards.

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 2012 recipient of the Ken Kennedy Award was Mary Lou Soffa, for “*contributions to compiler technology and software engineering, exemplary service to the profession, and life-long dedication to mentoring and improving diversity in computing.*”

Also, SIGARCH and SIGHPC jointly nominated Kathy Yelick for the ACM-W Athena Lecturer Award, which celebrates women researchers who have made fundamental contributions to Computer Science. Dr. Yelick was recognized “*For contributions to improving fundamental understanding and practice of parallel programming.*” She will present her award lecture at SC’13.

Three of the above awards, the Eckert-Mauchly Award, the Maurice Wilkes Award, and the Influential ISCA Paper Award were presented at ISCA 2013 in Tel-Aviv, Israel.

## 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. And new non-volatile memory technologies have spurred the development of novel memory and storage architectures, which have great promise for transforming solutions for Big Data applications. 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 2013 included tutorials on energy-secure architectures, workloads for the cloud, security, and power, as well as workshops on architectures for Big Data, Brain-inspired computing, architectural support for security and privacy, energy efficiency, and energy security.

### Innovative Programs

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, with the encouragement of ACM, has begun exploring the creation of a European SIGARCH, implemented through the SIG Chapter mechanism. Goals of a European SIGARCH Chapter include:

- promote student research and education activities to make the computer architecture community grow long term
- promote networking events; conferences, workshops and summer schools
- promote collaboration with other SIGs (e.g. SIGPLAN, SIGOPS, SIGBED) within Europe as well as globally

This effort is still in its early stages, but we have high hopes that it will be successful and emulated in other regions, especially India, China, and South Korea. There is already a group in Korea that is interested in establishing a chapter there.

### 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 FY2013, SIGARCH budgeted \$80,000 for travel grants. For ISCA 2013, SIGARCH funding for student travel was also supplemented by sponsorship from IEEE, Google, and vmware (SIGARCH funds accounted for half the total student travel funds). 65 students were funded by the ISCA student travel grant, of which 41 of those were recipients of SIGARCH funding. 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 FY13.

### 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 40th annual ISCA (ISCA 2013) was held in Tel-Aviv, Israel. Avi Mendelson was the General Chair, and Margaret Martonosi was the Program Chair. ISCA 2013 has been pledged \$86,000 in industrial donations to support the conference, plus an additional \$62,000 in support for student travel grants (\$30,000 of this from SIGARCH). ISCA 2014 will be held in Minneapolis, with Avi Pen-Chung Yew and Antonia Zhang as General Chairs and Steve Keckler as Program

Chair. ISCA 2015 will be held as part of FCRC. The program chair is in the process of being selected and the General Chair will be selected once the FCRC venue is finalized.

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 2012 was held in Salt Lake City, UT and SC 2013 will be held in Denver, CO. 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 2013 was held in Houston, TX, with Vivek Sarkar serving as General Chair and Ras Bodik serving as Program Chair. ASPLOS 2014 will be held in Salt Lake City, UT, with Al Davis and Rajeev Balasubramanian as General Chairs and Sarita Adve as Program Chair. ASPLOS 2015 will begin a cycle where every third year the conference is held internationally. ASPLOS 2012 was held in London, England. ASPLOS 2015 will be held in Istanbul, Turkey with Kemal Ebcioglu and Ozcan Ozturk as General Chairs and Sandhya Dwarkadas as Program Chair.

SIGARCH sponsors the International Conference on Supercomputing (ICS). ICS 2013 was held in Portland, OR. Allen Maloney was General Chair and Sam Midkiff and Mario Nemirovsky were Program Co-Chairs. ICS 2014 will be held Munich, Germany June 10th to 14<sup>th</sup>.

The 20th Symposium on Parallel Algorithms and Architectures (SPAA 2013), jointly sponsored by SIGARCH and SIGACT, was co-located with PODC in Montreal, Canada, with Guy Blelloch as General Chair and Berthold Vöcking as Program Chair. SPAA 2014 will be held in Prague and SPAA 2015 expects to be part of FCRC.

SIGARCH is one-half co-sponsor of the IEEE/ACM International Conference on Grid Computing. Grid 2012 was held in Beijing, China, with Dieter Kranzlmüller and Weimin Zheng as General Co-Chairs and Rajkumar Buyya and Hai Jin as Program Co-Chairs. Beginning in 2013, Grid 'XY has merged with CCGrid, below.

SIGARCH is a 10% co-sponsor of CCGrid: The IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing. CCGrid '13 was held in Delft, The Netherlands, with Dick Epema as General Chair and Thomas Fahringer as Program Chair. CCGrid '14 will be held in Chicago, IL with Xian-He Sun and Ian T. Foster as General Chairs and Kirk W. Cameron and Dimitris S. Nikolopoulos as Program Chairs.

SIGARCH is one-half cosponsor of the International Symposium on High Performance Distributed Computing. 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. HPDC 2014 will be held in Vancouver, BC, Canada, with Beth Plale and Matei Ripeanu as General Chairs and Franc Cappello and Dongyan Xu as Program 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 2012 was 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. Pact 2013 will be held in Edinburgh, Scotland, with Michael O'Boyle as General Chair and André Seznec and François Bodin as Program Chairs.

SIGARCH is one-fourth co-sponsor of the Symposium on Architectures for Networking and Communications Systems (ANCS). ANCS 2012 was held in Austin, TX, with Tilman Wolf as General Chair and Andrew Moore and Vikto Prasanna as Program Co-Chairs. ANCS 2013 will be held in San Jose, CA, with Walid Najjar as General Chair and Raj Yavatkar and Scott Rixner as Program Chairs.

In 2007 SIGARCH was a founding co-sponsor of the International Symposium on Networks-on-Chips (NOCS). NOCS 2013 was 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. NOCS 2014 will be held in Ferra, Italy, with Davide Bertozzi as General Chair.

SIGARCH also became a cosponsor of the International Conference on Autonomic Computing (ICAC) in 2007. ICAC 2012 was held in San Jose, CA, with Dejan Milojevic as General Chair and Vanish Talwar and Dongyan Xu as Program Co-Chairs. As a result of a disagreement in direction between conference founder Salim Hariri and the steering committee, ICAC has now split into two separate conferences, with SIGARCH dropping to in-cooperation status with each one. The original ICAC is now being sponsored by Usenix, with ICAC 2013 being held in San Jose, with Jeffrey Kephart as General Chair and Calton Pu and Xiaoyun Zhu as Program Chairs. A new conference, Cloud and Autonomic Computing (CAC), has been created with a somewhat broader focus. The first offering of this conference, CAC 2013, will take place in Miami, FL with Salim Hariri as General Chair and Alan Still as Program Chair. We will monitor these two conferences to ensure that they remain successful and meet SIGARCH's high standards.

In addition to the above conferences, SIGARCH is co-sponsoring, or is 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, HiPC, HPDS, ICWET, IPDPS, HotChips, 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, 770, 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 \$1.3M fund balance required by the ACM for sponsorship of SIGARCH conferences for FY'12. The projected SIGARCH fund balance for FY'12 is \$3,083,993. 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.

In FY12, SIGARCH implemented an increase in print membership fees to be break-even (SIGARCH was losing \$13 per professional print membership and \$23 per student print membership). The online membership rates were not changed and continue to be \$6 and \$2 respectively. Going into the fiscal year, we were concerned about potential implications of this change on the membership, but FY13 membership rates did not see any significant change and are projected to be slightly higher than last year.

#### SC Conference Grants

For SC'13, \$208,281 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 1434 as of May 2013. 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, 770, of SIGARCH's members chose electronic-only membership. There is opportunity to increase membership, particularly of students, and we will explore increased outreach to facilitate increased student participation. 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