SIGMOBILE FY'18 Annual Report

July 2017 – June 2018

The purpose of ACM SIGMOBILE is to promote research and development by bringing together researchers and practitioners and fostering interest in the mobility of systems, users, data, and computing. SIGMOBILE will address the above spectrum of topics, sharing one common theme - mobility. The group's technical scope reflects the emerging symbiosis of portable computers and wireless networks, addressing the convergence of mobility, computing and information organization, its access, services, management and applications.

In the past few years, mobile computing has developed into a fast moving, topical, and exciting area of computer science and engineering. Supporting the mobile computing and wireless networking research community, SIGMOBILE sponsors multiple successful conferences and workshops (e.g., MobiCom, MobiSys, MobiHoc, SenSys, UbiComp, PerDis, SEC, and HotMobile) that are well attended by its members, and generating high-quality and widely cited publications. These are valuable services for SIGMOBILE's members and the community, resulting in a strong Special Interest Group, with about 700 members.

SIGMOBILE's Executive Committee (EC) in this period comprised of:

- Chair: Prof. Marco Gruteser (Rutgers University, New Brunswick, USA)
- Vice Chair: Prof. Jason Flinn (University of Michigan, Ann Arbor, USA).
- Secretary: Prof. Giovanni Pau (LIP6, France)
- Treasurer: Prof. Falko Dressler (University of Paderborn, Germany)
- Past Chair: Prof. Suman Banerjee (University of Wisconsin, Madison, USA)

Awards

SIGMOBILE has a number of awards that it bestows of community members every year. In addition to the Outstanding Contributions Award (OCA) for career-long achievements, the Rockstar award for early career achievements, a Distinguished Service Award for service to the community, the Test of Time award for papers that had a significant influence in the community, and various best paper awards at the leading conferences, SIGMOBILE launched a new award this year --- ACM SIGMOBILE Doctoral Dissertation Award for best PhD work in the field. In addition, SIGMOBILE also recognizes some of the best work in the current year, as identified by a selection committee, which are considered the Research Highlights of SIGMOBILE.

Some of the notable award winners are mentioned below.

Outstanding Contributions Award: Prof. Teresa Meng (Stanford)
Rockstar Award: Prof. Kyle Jamieson (Princeton University)
Doctoral Dissertation Award: Fadel Adib (MIT, Advisor: Prof. Dina Katabi)

The SIGMOBILE Test of Time awards were selected by a committee chaired by Prof. Ashutosh Sabharwal. The committee comprising Prof. Xia Zhou, Prof. Serge Fdida, Prof. Guiseppe Bianchi, Prof. Luca Mottola, Prof. Shyam Gollakota, and Prof. Vijay Raghunathan selected the following articles:

- M. Satyanarayanan, "Pervasive Computing: Vision and Challenges," IEEE Personal Communications, 8(4), August 2001.
    - The paper connects the vision of pervasive computing to distributed systems and mobile computing as we knew them then, then draws fundamental observations of what system components still needed to be developed and how. The paper is a travel in time. What we call today the "Internet of Things" was already described here, along with many other fundamental concepts such as edge computing, cloud offloading, energy-driven adaptation, thick and thin clients. As an eminent example of abstract thinking, the author revealed the essence of each and every research challenge independent of the technology available back then.

- Charles E. Perkins and Elizabeth M. Royer. "Ad-hoc On-Demand Distance Vector Routing," ACM Workshop on Mobile Computing Systems and Applications (WMCSA), 1999
    - This paper presents AODV, perhaps the most influential ad hoc routing protocol to date. This algorithm proposes a novel and suitable solution for the operation of these dynamic and unstable networks. Its major impact on the industry and related standards demonstrate the practical importance of this work. Additionally, the protocol is a "must-teach" in academic curricula related to mobile networking.

- Eugene Shih, Paramvir Bahl and Michael J. Sinclair, "Wake on Wireless: An Event Driven Energy Saving Strategy for Battery Operated Devices," ACM MobiCom 2002.
    - This paper pioneered the systematic use of low- and high-power radios in a battery-constrained device, by separating data and control channels, to minimize overall energy consumption. The approach is now used commonly in today's mobile devices. Additionally, the rigorous experimental approach had a significant impact on the research methodology in mobile computing community.

- Jitendra Padhye, Victor Firoiu, Don Towsley and Jim Kurose, "Modeling TCP throughput: A simple model and its empirical validation," 28(4), ACM SIGCOMM, 1998.
    - The TCP model presented in this work is arguably the one that significantly influenced the SIGMOBILE community. Not only elegantly simple but also capable of accurately predicting TCP's throughput over a very wide range of loss rates. After two decades, it is still taught in several networking classes, and often used as a starting point for related modeling research.

- Rudolf Ahlswede, Ning Cai, Shuo-Yen Robert Li and Raymond W. Yeung, "Network Information Flow," 46(4), IEEE Transactions on Information Theory, July 2000.
    - This is the seminal work on network coding that had a profound impact on the networking and mobile systems communities. The information theoretic analysis led to significant academic work for more than a decade in the networking community on leveraging network coding to build systems that achieve higher reliability and throughput.

- Bret Hull, Vladimir Bychkovsky, Yang Zhang, Kevin Chen, Michel Goraczko, Allen K. Miu, Eugene Shih, Hari Balakrishnan and Samuel Madden, "CarTel: A Distributed Mobile Sensor Computing System," ACM SenSys 2006.
    - This seminal paper proposed to leverage commodity sensing units on on-the-road vehicles to revolutionize the monitoring of road traffic and road hazard/surface for improving road safety. In addition to significant academic impact, the paper also generated real-world impact with the proposed concept being widely adopted in popular map applications. Additionally, the network stack designs to tolerate intermittent connectivity also had an impact on delay-tolerant mobile networking, including those targeting remote inaccessible regions.

Highlight Papers

Significant and Innovative Programs

SIGMOBILE organized the first ACM Internet of Things Day held with the MobiSys conference this year. In addition to a keynote by Vint Cerf (Google), the program included a panel, invited talks from local industry such as BMW or IBM, from other parts of Europe (Ericsson) and from the US (Intel). Speakers also presented short vision talks from an open call. The lively event was attended by about 200 participants. More details are available here:
https://www.sigmobile.org/mobisys/2018/iot_day_program/

SIGMOBILE's MobiCom conference is piloting a multiple submission deadline model with 2 deadlines per year. Papers submitted to both deadlines will undergo the rigorous review process with decisions rendered at an in-person technical program committee meeting after the reviewing phase for each deadline.

SIGMOBILE is continuing to expand the SIGMOBILE YouTube channel through which we provide video-recorded talks from our major conferences and workshops. This content is publicly available and anyone can now watch the talks from our conferences at their convenience, even if they were not able to attend the

conference itself. Engagement on this channel is rising significantly, with more than 80,000 views in 2017. Many of our viewers seem to be from countries that are traditionally underrepresented at our conferences, incuding Asia, South America, and Africa. This channel thereby allows us to reach many more constituents than our conferences and workshops currently do.

SIGMOBILE is delighted to continue to present the significantly transformed quarterly publication, *GetMobile,* which is a revamped version of the ACM SIGMOBILE Mobile Computing and Communications Review, (MC^{2}R). Each issue of GetMobile consists of a set of regular sections curated by a committed group of editors and has won a lot of praise from the broad community for improved quality of content and articles. SIGMOBILE also continues publishing technical papers in the mobile friendly ePub format which allows readers to better browse such materials on their phones and tablets. We have setup an arrangement by which any SIGMOBILE event can ensure that camera-ready papers can be easily converted into the ePub format and is made available through the ACM Digital Library. This reflects our commitment to keep up with the changing needs of the community and the ways in which we consume content in the modern world.

Events or Programs to Broaden Participation

SIGMOBILE operates a program to broaden participation that involves several key activities: workshops designed for underrepresented groups, informal lunch meetings and mentoring, and student travel grants.

The 2nd Asian Students Symposium on Emerging Technologies (ASSET) was held on January 8th and 9th in Bengalaru, India and was co-located with the COMSNETS conference. The goal of ASSET is to empower students from developing countries and regional universities with technical writing, speaking, and presentation skills and also allow them to experience a top-tier research conference. Each ASSET participant had to prepare a short research project writeup, record a 30s elevator pitch research presentation video, and present a research poster. These artefacts were evaluated by five faculty mentors (in small groups) and the students iterated their submissions based on this feedback. In the process, they substantially improved their ability to design, formulate, and communicate their research ideas. Overall, the 2nd ASSET was a tremendous success and was attended by 37 students from India, Singapore, Korea, and Bangladesh. The feedback from the student participants was very positive and we plan to have more such events in Asia and other continents.

In partnership with the N2Women group, we offer lunch meetings at our main conferences and occasionally a full day workshop that serve as a forum for researchers from underrepresented groups to network and to discuss career questions. Lunch meetings are organized by a graduate student under the mentorship of a senior researcher from the community. The graduate student is usually supported with a travel grant.

SIGMOBILE operates a student grant program that co-sponsors students travel costs to SIGMOBILE conferences. Conference organizers are asked to explicitly consider the goal of broadening participation when selecting travel grant awardees.

Budget permitting, SIGMOBILE also occasionally sponsors activities from partner organizations focused on broadening participation, such as the CRA-W conference.

Challenges and considerations facing the community

Greater industry engagement: We believe that SIGMOBILE can engage even better with the mobile and wireless industry that is having such a significant impact in the world today. We have taken some initial steps, e.g., the IoT Day, a Wireless Industry Days workshop, and the Youtube channel, the revamped GetMobile publication with a broader appeal. But much more can and should be done, and we need to look for better and greater ways of engaging with our broader industry.

Conference co-locations: SIGMOBILE today sponsors multiple major conferences --- MobiCom, MobiHoc, MobiSys, SenSys, UbiComp, along with two newer additions, PerDis and WUWNet. Each conference has slightly different focus, has thrived over the years, and is considered a premier venue in the field. However, sometimes there is a concern that too many conferences may dilute a community and there maybe need for periodic co-locations and greater coordination. This is an issue that require further introspection.

Summary

Mobile computing and wireless networking are among the fastest growing fields within computer science and engineering, and as a result SIGMOBILE continues to be a strong, successful, well-supported organization. SIGMOBILE organized an IoT Day to reach out to industry and the wider technical community, is piloting new submission deadline models at its conferences.

The SIG's conferences and workshops are well attended, creating a wealth of publications for the ACM digital library and the SIG's members. The community continues to create significant impact both technically and to the broader society through research, education, and other activities.