MOBILE COMPUTING & COMMUNICATIONS REVIEW
Volume 20, Issue 3 • July 2016

GetMobile

Teaching the INTERNET OF THINGS

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A PUBLICATION
OF ACM SIGMOBILE

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MESSAGE FROM THE EDITOR-IN-CHIEF

CONTRIBUTORS

Eyal de Lara

IN THIS ISSUE, we depart from our regular practice of highlighting papers from one of the top SigMobile sponsored conferences, and instead, we showcase research that addresses challenges of interest to the GetMobile readership, but which appeared at other ACM and USENIX venues. This *best of the rest issue* includes four highlight articles:

From the 13th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2016) we feature two papers: "EARP: Principled Storage, Sharing, and Protection for Mobile Apps," by researchers from University of Texas at Austin and Cornell Tech, introduces a consistent architecture for setting and enforcing access permission for data that is shared between applications in a mobile ecosystem; and "Passive WI-FI: Bringing Low Power to Wi-Fi Transmissions," by a team from the University of Washington describes how to generate 802.11b transmissions using backscatter communication, while consuming dramatically less power than existing Wi-Fi chipsets.

From the 21st International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2016), we highlight "Sidewinder: Efficient and Easy-to-Use Continuous Sensing." This paper, by a team of University of Toronto researchers, describes a new approach for continuous mobile sensing that simplifies the programming of heterogeneous architectures.

The forth highlight article, titled "The Anatomy of Smartphone Unlocking; Why and How Android Users Around the World Lock their Phones" synthesizes two related papers that appeared at the Conference on Human Factors in Computing Systems (CHI 2016). Authored by a team from the University of California at Berkeley, the International Computer Science Institute, and Google, this article shines light into the use of smartphone locking mechanisms by users around the world.

The rest of the issue consists of four more columns:

In the Retrospective column, David E. Culler looks back at over a decade of research efforts behind the success of the Internet of Things (IoT). Culler argues that the central challenge for IoT is the design of devices that *do nothing well* – energy-efficient designs that support sporadic operation and very low communication rates. The author discusses the varying degrees with which IoT research has been adopted by industry, and reflects on the road ahead including open challenges and opportunities.

In the Arm's Length column, Luis Ceze and Adrian Sampson argue that as single-threaded CPU performance stagnates, careful hardware-software co-design will enable computer systems to trade off accuracy of computation, communication, and storage for gains in efficiency and performance. The authors highlight two main challenges in approximate computing: the need for hardware technologies that trade off energy for accuracy, as well as tools that enable approximate computers to be safely programmed.

In the Standards column, Xuyu Wang, Shiwen Mao and Michelle X. Gong survey efforts by LTE operators to leverage the 5 GHz unlicensed band to accommodate the three orders of magnitude increase in data traffic that is anticipated by 2020. The article discusses different approaches to Wi-Fi and LTE co-existence, as well as recent efforts on LTE and Wi-Fi link aggregation.

Finally, in the Education column, Anna Förster, Jens Dede, Andreas Könsgen, Asanga Udugama and Idrees Zaman reflect on their experience teaching a Master's level course on the Internet of Things at the University of Bremen. The article addresses the central challenge in teaching the Internet of Things at the university level: how to teach students long-lived general principles and concepts given the rapidly evolving nature of the IoT ecosystem.

I hope you enjoy this issue, and I welcome your thoughts about GetMobile in general, and this issue in particular.

Editorial Board Changes

Robin H. Kravets is stepping down from the editorial board. As a founding co-editor of the Highlights column, Robin has played a key role in shaping GetMobile, and I thank her for her effort in the success of GetMobile.

It is my pleasure to welcome Xia Zhou as the new co-editor of the Highlights column. Xia is an Assistant Professor in the Department of Computer Science at Dartmouth College. She received her PhD at UC Santa Barbara in 2013. Her research interests are in mobile systems and wireless networking. Her recent work on visible light communication systems has won the Best Video Award at MobiCom 2015 and 2016, Best Demo Award at MobiSys 2015, and Best Paper Award at ACM VLCS 2014. Her earlier work on spectrum distributions won the Best Practical Paper Award at SIGMETRICS 2013, and Best Paper Award Finalist at MobiCom 2008. She also won other paper awards in UbiComp 2014 and 2015, HotWireless 2015. She is the recipient of the NSF CAREER Award in 2016 and Google Faculty Research Award in 2014.


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http://www.acm.org/sigmobile

ISSN 2375-0529