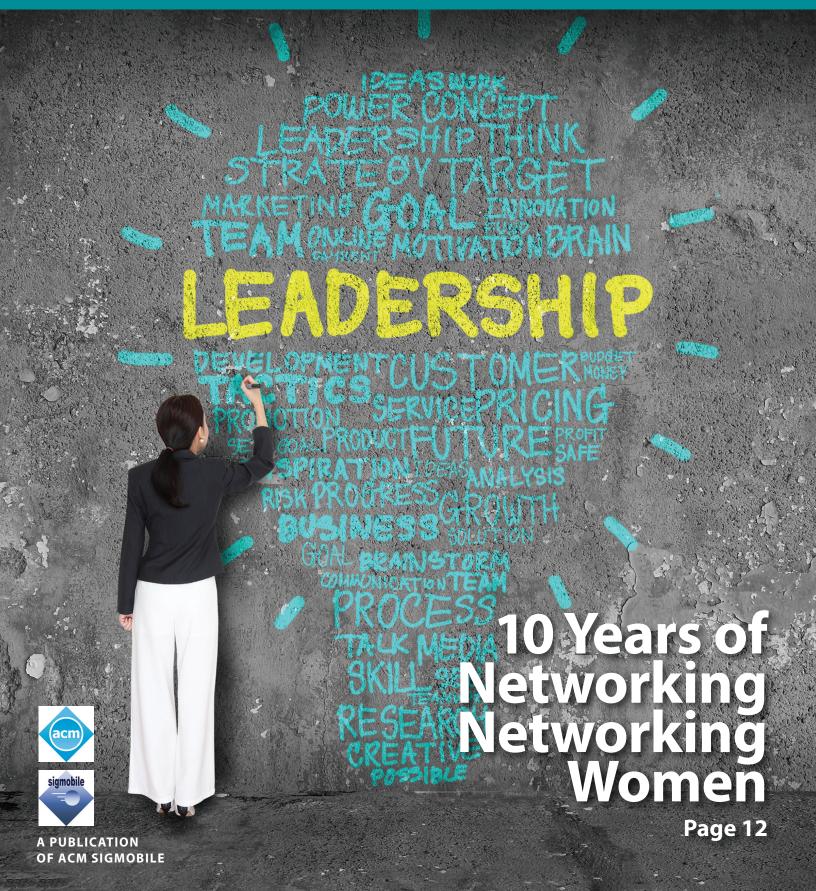
GetMobile



GetMobile

MOBILE COMPUTING & COMMUNICATIONS REVIEW

Volume 20, Issue 4 • October 2016

CONTENTS

Message from the Editor-in-Chief



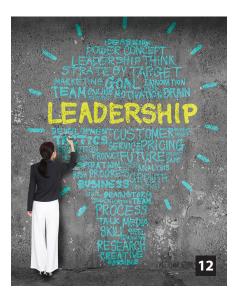
(ALMOST) UNPUBLISHABLE **RESULTS**

Datasets for Mobile, Wearable and IoT Research



EXPERIMENTAL METHODS

Pilot Studies: When and How to Conduct Them When Conducting User Studies



EDUCATION

12 10 Years of Networking Networking Women



MOBILE PLATFORMS

17 Mobile Systems Research With Drones



HIGHLIGHTS

23 FlashBack: Immersive Virtual Reality on Mobile Devices via Rendering Memoization



28 Practical Human Sensing in the Light



34 uLink: User-Defined Deep Links In Mobile Apps

MESSAGE FROM THE EDITOR-IN-CHIEF

CONTRIBUTORS

EDITOR-IN-CHIEF Eyal de Lara, University of Toronto

MANAGING EDITOR Donna Paris

DESIGNER JoAnn McHardy

SENIOR ADVISORS (Past Editors-in-Chief)
Paramvir Bahl, Microsoft Research
Suman Banerjee, University of Wisconsin, Madison
Srikanth Krishnamurthy, University of California,
Riverside

Jason Redi, BBN Technologies **Mani Srivastava**, University of California, Los Angeles **Nitin Vaidya**, University of Illinois, Urbana-Champaign

SECTION EDITORS

Sharad Agarwal, Microsoft Research Aruna Balasubramanian, Stony Brook University Nilanjan Banerjee, University of Maryland, Baltimore County

Geoffrey Challen, University at Buffalo
Prabal Dutta, University of Michigan
Carla S. Ellis, Duke University
Michelle X. Gong, Google
Marco Gruteser, Rutgers University
Nic Lane, Bell Labs and University College, London
Iqbal Mohomed, Samsung Research America
Matthai Philipose, Microsoft Research
Sami Rollins, University of San Francisco
Khai N. Truong, University of North Carolina,
Charlotte

Xia Zhou, Dartmouth College

ACM STAFF

Lin Zhong, Rice University

Julie Goetz, Administrator – Publications Production Adrienne Griscti, Program Coordinator – SIG Publications Fran Spinola, Program Coordinator – SIG Activities

SIGMOBILE EXECUTIVE COMMITTEE

Suman Banerjee, University of Wisconsin-Madison, Chair Lili Qiu, University of Texas Austin, Vice Chair Marco Gruteser, Rutgers University, Treasurer Alec Wolman, Microsoft Research, Secretary Roy Want, Google, Past Chair



Eyal de Lara

FOR THOSE WHO ARE KEEPING COUNT, this should have been the last hard copy issue of GetMobile; however, thanks to the enthusiastic support that the printed publication has received, and with the generous backing from SigMobile, we are able to continue to make GetMobile available to you in print form for at least one more year. Enjoy!

In this issue, we highlight three papers from ACM MobiSys 2016. "FlashBack:

Immersive Virtual Reality on Mobile Devices via Rendering Memoization," by Kevin Boos, David Chu and Eduardo Cuervo, describes a system that offers a full-quality VR experience on weak mobile devices. FlashBack lowers the energy and processing demands to display VR content by rendering images from a pregenerated cache of possible frames that a player might see.

In "Practical Human Sensing in the Light," Tiaxing Li, Qiang Liu and Xia Zhou present a new unobtrusive sensing approach for behavioral monitoring that uses LED panels on the ceiling and photodiodes on the floor to determine human gestures from light blockage patterns.

Lastly, in "uLink: User-Defined Deep Links in Mobile Apps," Tanzirul Azim, Oriana Riva and Suman Nath describe a method for creating mobile app deep links, which enable users to navigate to specific views within a mobile app. uLink automatically creates deep links to stateful views by observing how views are assembled during user interaction by intercepting messages sent to the page launcher method. uLink also supports links to views generated by user interaction events within a page using a limited form of record and replay.

The rest of the issue consists of four more columns:

The (Almost) Unpublishable Results column features an article by Reza Rawassizadeh and David Kotz that addresses the challenge of finding sensor-based datasets to evaluate ubicomp

and mobile computing research. This paper provides an overview of available sensor-based public datasets and their characteristics.

In the Experimental Methods column, Khai Truong discusses how to improve the likelihood of success when conducting a user study by running a pilot study – a small-scale version of an actual study – to help identify, remove, and avoid any potential problems early on.

In the Education column, Katia
Jaffrès-Runser, Sami Rollins, Tracy
Camp, and Wendi Heinzelman reflect on
the success of Networking Networking
Women (N²Women) on the occasion of
the organization's 10-year anniversary.
N²Women is a community for researchers
with the main goal of fostering connections
among women in computer networking and
related research fields. N²Women allows

women to connect with other women with common research interests, who face the same career hurdles, and who share common career objectives. The article describes the wide range of programs and events run by N²Women, and encourages readers to get involved in the organization.

Finally, in the Mobile Platforms column, Luca Mottola and Kamin Whitehouse reflect on their years of experience conducting research with drones. Their article provides an overview of the burgeoning drone software and hardware ecosystem and addresses mobile computing challenges made available by drones, such as reliability, energy management, mobile communication, and programmability.

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

Editorial Board Changes

Jacob Sorber is stepping down from the editorial board. As a founding co-editor of the (Almost) Unpublishable Results column, Jacob played an important role in shaping the direction of GetMobile, and I thank him for the many high-quality columns that he helped shepherd.

It is my pleasure to welcome Aruna Balasubramanian as the new co-editor of the (Almost) Unpublishable Results column. Aruna is an Assistant Professor at Stony Brook University. She received her Ph.D from the University of Massachusetts Amherst, where



Aruna Balasubramanian

her dissertation won the UMass outstanding dissertation award and was the Sigcomm dissertation award runner-up. She works in the area of networked systems. Her current work consists of two threads: (1) significantly improving mobile Web performance and (2) improving the usability and privacy of mobile systems. She is the recipient of a Ubicomp best paper award, a Computing Innovation Fellowship, a Microsoft Graduate Research Fellowship, a Google research award, and the Applied Networking Research Prize. She is passionate about improving the diversity in Computer Science and runs a Girls Who Code Club, founded the WPhD group for Women PhD students at Stony Brook, and is an active member of the N²Women group.

EDITORIAL CORRESPONDENCE

Address to: Prof. Eyal de Lara, 40 St. George Street, Suite 4283, Department of Computer Science, University of Toronto, Toronto, Ontario M5S2E4, Canada, Email: getmobile_editor@acm.org. For specific department email addresses, see the "Call for Contributions" on page 59.

NOTICE TO CONTRIBUTING AUTHORS TO SIG NEWSLETTERS

By submitting your article for distribution in this Special Interest Group publication, you hereby grant to ACM the following non-exclusive, perpetual, worldwide rights: to publish in print on condition of acceptance by the editor, to digitize and post your article in the electronic version of this publication, to include the article in the ACM Digital Library, and to allow users to copy and distribute the article for noncommercial, educational or research purposes. However, as a contributing author, you retain copyright to your article and ACM will make every effort to refer requests for commercial use directly to you.

ACM GETMOBILE

ACM SIGMOBILE publishes ACM GetMobile four times annually for its members. The Newsletter has a controlled distribution with the compliments of ACM SIGMOBILE. GetMobile assumes no responsibility for the return of submitted manuscripts, photographs, artwork, or other material. Nothing in this publication shall constitute an endorsement by ACM, or SIGMOBILE or GetMobile (collectively, the "Publisher") of any information contained in this publication, and the Publisher declaims any liability with respect thereto or the use or reliance on any such information. The information contained in the publication is in no way to be construed as a recommendation by the Publisher of any kind or nature whatsoever, nor as a recommendation of any industry standard, nor as an endorsement of any product or service, nor as an opinion or certification regarding the accuracy of any such information.

SIGMOBILE URL: http://www.acm.org/sigmobile

ISSN 2375-0529