

# Panel

## Cell Phones as a Research Platform

**Moderator:**

S. Keshav

University of Waterloo, Canada

### Panelists

**Yatin Chawathe**  
Google, USA

**Mike Chen**  
Ludic Labs, Inc., USA

**Yongguang Zhang**  
MSR, China

**Alec Wolman**  
MSR, USA

### Panel Summary

Cell phones are clearly the dominant platform for mobile computing and communication. Therefore, they are increasingly being used by the research community. Yet, building research prototypes using cellphones can be non-trivial. This panel brings together researchers who have successfully used cellphones in their work. They will address why they chose to work with cellphones and their experiences, both positive and negative. They will also offer their prognostications of future trends, and open research problems that ought to be addressed by the Mobisys community.

### Categories and Subject Descriptors

C.2.1 Network Architecture and Design

### General Terms

Algorithms, Performance, Design, Economics, Reliability, Experimentation, Security, Human Factors, Standardization.

### Keywords

Cell phones, Mobility, Research Platforms, System Design

*Yatin Chawathe, Google, USA.*

As phone devices increase in power, they present a unique opportunity to expand the reach of technology to sections of the world population that have often never used computers or the Internet. However, unlike personal computers and the Internet, most mobile phone platforms are closely controlled. To enable truly disruptive research ideas to emerge, there is real need for both an open mobile phone development platform and open access for data communication via mobile networks. At the same time, as mobile phones penetrate ever-growing markets and new applications develop, one of the biggest challenges that users will face is privacy of their information. This is especially true in the context of location-aware applications. Providing value to users while still providing strong privacy guarantees is an important challenge and a rich area for research.

*Mike Chen, Ludic Labs, Inc. USA.*

Mobile phones offer researchers a platform to understand user needs in real, mobile situations, to prototype truly mobile services, and to evaluate ubiquitous computing applications.

Besides, research on mobile phones could potentially affect more than 10 times the number of mobile PC users. Unfortunately, the research community has shown limited progress in using mobile phones as a research platform. This is partly due to engineering barriers such as closed and fragmented platforms, and longer software development and testing cycles. Perhaps more challenging are the high expectations users have for personal, mobile devices and the need to support real, mobile usage scenarios. Solving these challenges will open up new opportunities for research communities ranging from mobile systems to computer human interaction. With more and more connectivity options and sensors (e.g. location, accelerometer, etc) being added to commodity mobile phones, we can expect exciting and relevant research in this space and a shift in focus from nomadic computing to mobile computing.

*Yongguang Zhang, Microsoft Research, China*

We chose cellphones as a research platform because it is truly pervasive and has a potential to make great research impact. However, it is not yet a good research platform because its architecture is neither open nor extendable, technology innovations are still constrained by barriers set up by different commercial interests, and researchers still lack of useful tools. I will share our experiences in a few research projects and suggest an open research platform for the community.

*Alec Wolman, Microsoft Research, USA*

Cell phones are already the world's most popular computing platform, yet they have received relatively little attention from the systems and networking research communities. This is mainly due to the inability to tinker with the cellular network infrastructure: on clients, much of the network stack is a black box; on the server side the entire infrastructure is inaccessible to most researchers.

Just as PlanetLab has revolutionized the ability for networking researchers to perform wide-area Internet research, I will argue that the high cost of entry to performing research in the area of cellular voice and data networks motivates coordination in the research community to create a shared research infrastructure. I will discuss the challenges in creating such an infrastructure, which I believe are significantly more difficult than the problems faced by the networking community in constructing a shared infrastructure for wide-area Internet research.