

Guest Editorial: Special Section on Outstanding Papers from MobiCom 2012

Lili Qiu, *Senior Member, IEEE*

I am delighted to introduce three outstanding papers in this special section. These papers were presented at the Annual International Conference on Mobile Computing and Networking (MobiCom) held in August 2012 in Istanbul, Turkey.

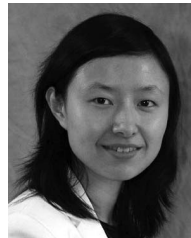
User authentication on mobile devices requires users to manually enter passwords or PINs, which is cumbersome and vulnerable to spoofing. The first paper, titled "Capacitive Touch Communication: A Technique to Input Data Through Devices' Touchscreen," invents a novel technology that allows users to authenticate with a capacitive touch screen using a simple finger swipe. The finger is equipped with a small device that stores a secret key and transmits an on-off keying signal to the capacitive touch screen to authenticate the user. The reviewers commented that this work was "ingenious," "disruptive," and "creative." While it remains to be seen how it competes with other alternative schemes, such as near field communication (NFC), its implementation shows promise. Capacitive touch communication not only creates a new mode of user authentication, but also may bring other new applications. This paper was selected to receive the best paper award at MobiCom 2012.

The second paper, titled "Fast Spectrum Shaping for Next Generation Wireless Networks," tackles an important topic—dynamic spectrum access (DSA). It designs and implements RODIN, a novel protocol for per-frame spectrum shaping. RODIN turns a commercial off-the-shelf (COTS) wireless device into a device with spectrum agility by connecting it through the antenna ports on the COTS. It further designs a new preamble that allows a receiver to identify the frequencies used by the transmitter. This work represents an important step toward fully embracing DSA and making DSA widely available.

The third paper, titled "Rate Adaptation for 802.11 Multiuser MIMO Networks," proposes TurboRate, a novel rate adaptation for uplink in 802.11 multiuser MIMO networks. In TurboRate, the client measures the channel coefficients from the access point (AP) and computes 1) the direction of its signal arriving at the AP and 2) its SNR when it is transmitting to the AP alone. The first client that wins the medium selects the rate based on SNR as usual. A subsequent client projects its signal orthogonal to the signals from the other clients whose transmissions are already in the air and selects the optimal data rate based on

its SNR after projection. The idea is intuitive and effective. Its USRP implementation shows impressive performance benefit of this approach.

Finally, I would like to take this opportunity to thank the anonymous reviewers for providing insightful comments to the authors.



Lili Qiu received the MS and PhD degrees in computer science from Cornell University in 1999 and 2001, respectively. She is currently an associate professor at the University of Texas (UT) at Austin. Before joining UT in 2005, she spent four years as a researcher at Microsoft Research Redmond working on Internet and wireless networking research. She received the US National Science Foundation CAREER Award in 2006. She has chaired several networking conferences (e.g., ACM MobiCom, IEEE ICNP, IEEE SECON, WICON), served as an editor for several networking journals (e.g., *IEEE/ACM Transactions on Networking* and *IEEE Transactions on Mobile Computing*), and served on the program committees of many conferences. She also serves as vice chair for ACM SIGMOBILE. She is a senior member of the IEEE.

• The author is with the University of Texas at Austin, 2317 Speedway, Stop D9500, Austin, TX 78712-1757. E-mail: lili@cs.utexas.edu.

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