

# Opportunistic Crowds: A Place for Device-to-Device Collaboration in Pervasive Crowd Applications

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**Abstract**—Existing pervasive computing applications entail high degrees of communication, but existing deployments by and large rely on either a backend Internet connection to support communication or provide only one-way distribution of data (e.g., via environmental beacons). However, the pervasiveness of sensing, computation, and communication has changed the landscape of potential pervasive crowd applications. The plain "chattiness" of our everyday environments opens broad new possibilities for pervasive computing devices to opportunistically leverage each other, where the potential capability of a whole opportunistic crowd is much larger than the sum of its individuals' capabilities. In this talk, I will present both concrete motivating application domains and technical capabilities and constraints that lead us to consider the potential of direct device-to-device collaboration in support of crowd applications in pervasive computing. Drawing on my group's work in collaborative, opportunistic context-awareness, I will create a roadmap for research in support of a future vision of opportunistic crowds.

**Index Terms**—Pervasive computing, Device-to-Device collaboration, Opportunistic crowd, Context-awareness

## SPEAKER BIO

**Christine Julien:** is a Professor at the University of Texas at Austin in the Electrical and Computer Engineering Department. Her research is at the intersection of pervasive computing and software engineering, investigating programming abstractions, middleware, models, and tools that ease the programming burden in these complex, dynamic, and unpredictable environments. She has published more than 130 conference and journal publications in her career. Her work has been supported by the National Science Foundation (NSF), the Air Force Office of Scientific Research (AFOSR), the Department of Defense, Freescale Semiconductors, Google, and Samsung. Dr. Julien graduated with her D.Sc. in 2004 from Washington University in Saint Louis. She earned her M.S. degree in 2003 and her B.S. with majors in Computer Science and Biology in 2000 (both also from Wash. U.).