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Computer Science Seminar Series
National Capital Region

Distributed Algorithms in the Age of Open Airwaves

Speaker: Prof. Calvin Newport
Georgetown University
Friday, March 29, 2013
1:00PM- 2:00PM, NVC 325

Abstract

As we enter an era of ubiquitous computing, network practioners are faced with a difficult new scenario: large numbers of heterogeneous wireless devices crowding into the same bands of the radio spectrum. The resulting conflicts in these shared spectrum networks cause unpredictable interference.

In this talk, I will describe my efforts to apply techniques from distributed algorithm theory to solve practical networking/communication problems in this chaotic setting. At the core of my approach is the integration of an (bounded) adversary into the network model to incarnate the diversity of unpredictable interference experienced in real shared spectrum networks. These models are more difficult than those based on well-characterized stochastic processes, but they cover a much broader class of behavior and therefore generate stronger proofs. Perhaps surprisingly, given the difficulty of such models, I will show they sill allow efficient solutions to core problems such as local/global broadcast, gossip, leader election, and graph structure construction.

The resulting distributed algorithms are some of the first known to achieve provable efficiency and correctness in this difficult but increasingly relevant setting.

Biography

Calvin Newport is an Assistant Professor in the Department of Computer Science at Georgetown University. His research focuses on distributed algorithm theory. Previously, Newport was at MIT, where he earned his Ph.D. in 2009 in the Computer Science Department's Theory of Computation group, and then spent two years as a Postdoctoral Associate in the Network and Mobile Systems group.