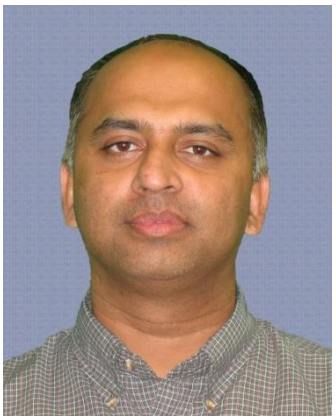
BWA 2012 KEYNOTE TALK



"Small Cells: The Next Big “Small” Thing in Cellular Deployments"

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http://www.nec-labs.com/research/broadband/broadband_mobile-website/staff.php

Abstract

The exponential growth in mobile data traffic is forcing mobile operators to explore new network deployments that will support such growth. Although advancements in traditional physical layer techniques are still being considered an option for improving spectral efficiency (and thus throughput gains), there is now a realization that new architectural deployment models need to be considered to provide substantial gains. In this regard, “Small Cell” deployments (micros, picos and femtos) are now being considered a viable and useful paradigm to achieve large gains. Small cells bring users closer to the base station thereby increasing the average cell throughput; at the same time, the area spectral efficiency gains achieved through spectrum reuse leads to network wide throughput gains.

To leverage the potential of small cells, a number of challenges have to be overcome. Small cells are expected to be deployed as an underlay to the macro cellular network (forming a heterogeneous network or HetNet) in a dense, ad-hoc and (possibly) uncoordinated manner. Achieving higher spatial reuse in such deployments would require efficient resource (and interference) management between the macros and the small cells as well as among the small cells. Given the dense deployments of such cells, self-optimization techniques (SON) would become a necessity as well. In addition, backhauling small cell traffic becomes a challenge when compared to the traditional planned macro cellular deployments. One option to address these challenges is the use of Cloud-RAN type architecture for the deployment of small cells. This talk will explore the advantages, requirements and challenges in such deployments.

Biography

Sampath Rangarajan heads the Mobile Communications and Networking Research Department at NEC Laboratories America in Princeton, New Jersey. Previously, he was a researcher in the Networking Research Center at Bell Laboratories in Holmdel, New Jersey and in the Systems and Software Research Center at Bell Laboratories in Murray Hill, New Jersey. Before joining Bell Laboratories, he was an assistant professor in the Electrical and

Computer Engineering Department at Northeastern University in Boston, Massachusetts. He has also served as a cofounder and vice president of technology at Ranch Networks, a venture funded startup in the IP networking space. His research interests span the areas of mobile communications, mobile networks and distributed systems. Sampath is a senior member of the IEEE and has been on the editorial boards of IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems and ACM Mobile Computing and Communications Review. He received a PhD in computer sciences from the University of Texas at Austin.