

# White Space MIMO

Rice University researchers unveiled transmission scheme for UHF spectrum

Doug Lung · Sep 11, 2014

Rice University's Wireless Network Group has created a multi-user, multi-antenna transmission scheme for UHF spectrum. The researchers unveiled their scheme at the Association for Computing Machinery's MobiCom 2014 conference in Maui on Sept. 9.

Rice graduate student Narendra Anand, lead author of the study, said, "To be able to leverage the best characteristics of the UHF band, we need to be able to efficiently use the lanes that we have. One way to do that is with multi-user MIMO, a multi-antenna transmission technique that serves multiple users over the same channel simultaneously."

Researchers used the Rice Wireless Network Group's "wireless open-access research platform" to build what they claim to be "the world's first open-source, multiple-input, multiple-out test system capable of serving multiple users over UHF."

Kudos to Rice University for making the paper freely available on-line. See [The Case for UHF-Band MU-MIMO](#) by Narendra Anand, Ryan E. Guerra, and Edward W. Knightly at Rice University. In Houston, Texas. The photos in the paper show this isn't suitable for a hand-held device, but it isn't too much larger than some of the bigger multiple antenna Wi-Fi routers. The paper describes the Wideband UHF Radio Card, a new SDR analog front-end Rice researchers designed to enable high-power, long-range experiments and hardware prototypes for UHF frequencies.

The paper says the group used off-the-shelf nondirectional 3 dBi DTV antennas (August DTA240), which were actually smaller than the dual-band 2.4/5.8 GHz L-com HG2458-5RD-RSP antennas used in the experimental platform. The Rice system uses a real-time 802.11a/g reference design. The paper says "the real-time capabilities of the 802.11 reference design are leveraged to provide fine-grained continuous channel estimates from multiple transmitting antennas in order to directly measure the MU-MIMO channel capacity instantaneously and over a long period of time.

This is interesting technology. I wonder if it could be used to enable broadcasting to individual devices if combined with an Internet back-channel that would provide real-time data on the propagation channel?

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