Zeroing in on Wi-Fi 'dead zones'

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Rooting out Wi-Fi "dead zones" in large wireless networks that cover whole neighborhoods or cities is an expensive proposition. Pre-deployment testing is so costly that most WiFi providers simply build their networks first and fill in the gaps later. But even that isn't easy, due to the paucity of inexpensive techniques for mapping out precisely which areas lack coverage.

Now, thanks to an award-winning technique developed at Rice University and Hewlett-Packard Laboratories (HP Labs), Wi-Fi architects can test and refine their layouts using readily available information. The research, which won best-paper honors last week at the annual MobiCom '08 wireless conference in San Francisco, promises to make it cheaper and easier to get proper wireless coverage.

"In the real world there are many things than can interfere with signals and limit coverage," said lead researcher Edward Knightly, professor in electrical and computer engineering at Rice. "Our goal was to efficiently characterize the performance of urban-scale deployments, and our techniques can be used to either guide network deployment or to assess whether a deployed network meets its performance requirements."

The new technique uses a small number of measurements to predict how well a wireless transmitter will cover a particular portion of a neighborhood. The only information required is basic topography, street locations and general information about land use.

Knightly and research collaborators Ram Swaminathan, senior research

scientist at HP Labs, and Joshua Robinson, Rice graduate student, demonstrated their new method on two high-profile networks -- Google's system in Mountain View, Calif., and TFA-Wireless, an experimental network designed and built by Rice and owned and operated by Houston-based nonprofit Technology For All. TFA-Wireless provides high-speed Internet access to more than 4,000 users in a working-class neighborhood in east Houston.

Source: Rice University