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Researchers send data over UHF 'Super' Wi-Fi

By Sean Kinney, Editor in Chief on JULY 14, 2015

Network Infrastructure, Wi-Fi



“Due to the popularity of cable, satellite and Internet TV, the UHF spectrum is one of the most underutilized portions of the wireless spectrum in the United States. That’s a bitter irony because the demand for mobile data services is expected to grow tenfold in the next five years, and the UHF band is perfectly suited for wireless data.”

That statement is from Edward Knightly, professor and department chair of electrical and computer engineering and director of the Wireless Network Group at Rice University in Houston.

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UHF spectrum ranges from 400 MHz to 700 MHz and propagates over a much greater distance than Wi-Fi, which can be easily confounded by walls and other structural features. Thus, wireless UHF transmission is sometimes referred to as Super Wi-Fi.

Knightly and Rice engineers recently demonstrated a system that wirelessly sends data over UHF simultaneous to television broadcasts. The extension of that is a new type of TV, or even remote, that could accommodate a Super Wi-Fi network.

Despite the potential, the UHF band is not used very often; in 2014, Nielsen reported that less than 10% of U.S. households access UHF broadcasts.

“Unfortunately,” Knightly said, “in the most densely populated areas of the country, where the need for additional wireless data services is the greatest, the amount of available white space is extremely limited. In our most recent tests in Houston, one channel is open in parts of the city and none are available in others. This is fairly typical of a large U.S. urban area.”

Knightly and a Rice student put together Wi-Fi in Active TV Channels, or WATCH, which monitors nearby TVs to ensure there’s no reception interference while inserting data transmissions into the same channel.

Mary Ellen Carroll, a designer, futurist and director of Public Utility 2.0/VUUM, led a discussion on the topic for the interactive portion of the [2015 SXSW festival](#), which features sections on technology, film and music.

Citing research from *The New York Times*, Carroll said that more than 60 million Americans do not have access to the Internet. That issue of access, she said, could be solved through clever utilization of disused UHF/VHF spectrum formerly dedicated to television broadcast.

“These old TV frequencies can, in fact, be used to create new networks,” she said. “It may not be the case if the [Federal Communications Commission] auctions off these licenses to the highest bidder. ... Next year the FCC will conduct a reverse auction, which allows broadcasters to sell the spectrum rights to the United States, followed by a forward auction when they will auction the licenses to that spectrum.”



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Managing Editor Sean focuses on multiple subject areas including DAS, small cells, cloud computing, 5G and Internet of Things vertical applications. He also hosts RCRtv's HetNet Happenings web show focused on physical infrastructure. Prior to his work at RCR, Sean studied journalism and literature at the University of Mississippi then spent six years based in Key West, Florida, working as a reporter for the Miami Herald Media Company. He currently lives in Fayetteville, Arkansas.

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