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US FCC Experimental license application
for the study of whitespace communications

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This experimental license application is to study whitespace communications implemented via frequency translation of various modern air interfaces such as LTE with cognitive radio sensing & dynamic spectrum management overlays.

The fixed and mobile equipment will utilize the software defined, WDR radio pictured (in an early version) below:



Figure 1

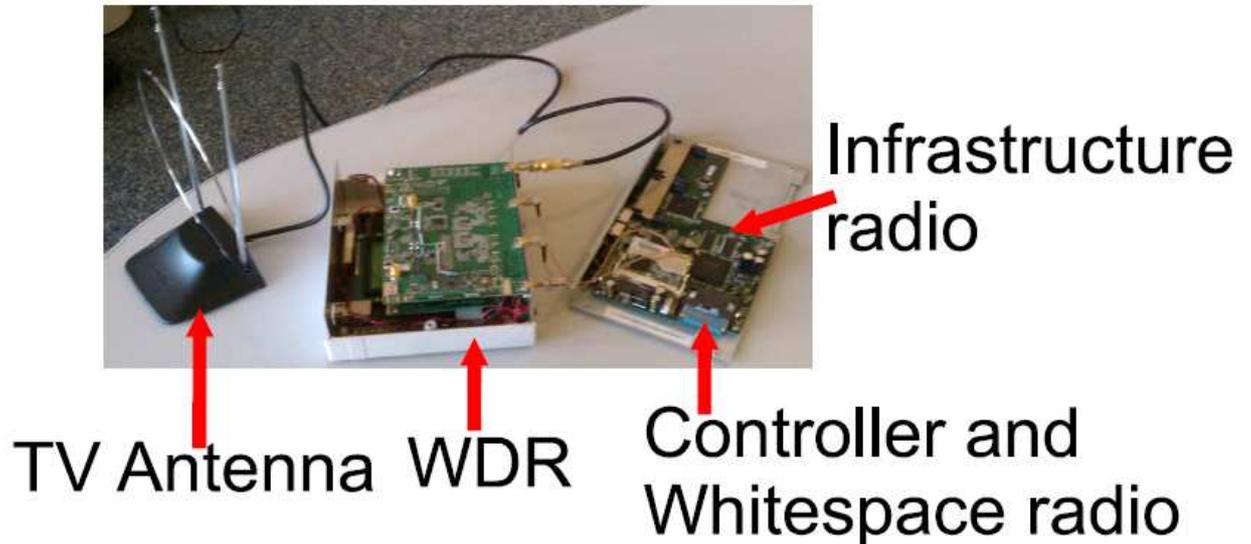


Figure 2

A summer intern student will be configuring the equipment to transmit and receive LTE waveforms that are frequency shifted to the appropriate whitespace frequency channel and will coordinate with the spectrum database proxy services to develop equipment aimed at complying with the Whitespace rules codified in 47CFR15.701 through 15.717. The equipment will be strictly kept from causing interference to the local TV broadcasts, typically only operating on channels 22, 27, 42, 47 and 50 when connected to antennas.

The work will take place in the Bell Labs headquarters in Murray Hill, NJ under the direction of Dr. Milind Buddhikot (<http://www.bell-labs.com/user/mbuddhikot/Front.html>).

This work is expected to lead to publications such as those already prepared based upon theoretical work and collaborative experimental work such as:

Buddhikot, M.M.; Kolodzy, P.; Miller, S.; Ryan, K.; Evans, J.; "DIMSUMnet: new directions in wireless networking using coordinated dynamic spectrum," *World of Wireless Mobile and Multimedia Networks, 2005. WoWMoM 2005. Sixth IEEE International Symposium on a*, vol., no., pp. 78- 85, 13-16 June 2005

doi: 10.1109/WOWMOM.2005.36

<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1443488&isnumber=31043>

Buddhikot, M.M.; Ryan, K.; , "Spectrum management in coordinated dynamic spectrum access based cellular networks," *New Frontiers in Dynamic Spectrum Access Networks, 2005. DySPAN 2005. 2005 First IEEE International Symposium on*, vol.,

no., pp.299-307, 8-11 Nov. 2005

doi: 10.1109/DYSPAN.2005.1542646

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1542646&isnumber=32916>

Kuzminskiy, A.M.; Abramovich, Y.I.; , "Adaptive Antenna Array Interference Mitigation Diversity for Decentralized Dynamic Spectrum Allocation in License-Exempt Spectrum," *Communications, 2009. ICC '09. IEEE International Conference on* , vol., no., pp.1-5, 14-18 June 2009

doi: 10.1109/ICC.2009.5198695

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5198695&isnumber=5198564>

Kuzminskiy, A.M.; Abramovich, Yu.I.; , "Decentralized Dynamic Spectrum Allocation Based on Adaptive Antenna Array Interference Mitigation Diversity," *Signal Processing, IEEE Transactions on* , vol.58, no.4, pp.2246-2260, April 2010

doi: 10.1109/TSP.2010.2040688

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5393051&isnumber=5427215>

Buddhikot, M.M.; Ryan, K.; , "Spectrum management in coordinated dynamic spectrum access based cellular networks," *New Frontiers in Dynamic Spectrum Access Networks, 2005. DySPAN 2005. 2005 First IEEE International Symposium on* , vol., no., pp.299-307, 8-11 Nov. 2005

doi: 10.1109/DYSPAN.2005.1542646

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1542646&isnumber=32916>

Ramachandran, E. Belding, K. Almeroth, and M. Buddhikot, "Interference-Aware Channel Assignment in Multi-Radio Wireless Mesh Networks," *Proc. IEEE INFOCOM*, 2006.