

## **Resource allocation to mitigate channel interference in mobile wireless sensor networks**

### **Abstract**

Wireless Sensor Networks (WSNs) are formed with multiple sensor nodes that use the IEEE 802.15.4 protocol. The WSN can operate in 16 different channels in the unlicensed Industrial, Scientific and Manufacturing (ISM) 2.4 GHz spectrum. The WLAN or IEEE 802.11g/n protocol also operates in the same spectrum. Additional problems arise when the WSN is mobile. Mobile WSN's are more efficient in scenarios where mobility is needed to collect data from remote target areas. Moving nodes may encounter overlapping frequencies from WLAN coexistence in its journey. Therefore, WSN channels have to be allocated intelligently to avoid channels overlapping with the WLAN. However with mobile WSN the WLAN networks encountered may have random spectrum allocation depending on the WLAN technology in place. A good resource allocation approach is needed for the sensor nodes to dynamically change their working channel to avoid the overlapping channels which cause interference to the network (either WSN or WLAN) which impacts the service delivery. This paper focuses on the interference when the mobile WSN and WLAN both exist in the same building. The analysis presented is based on the percentage of packets dropped and percentage of packet re-transmitted for each sensor node in the experiments. The outcome of this research will be valuable to research and development of WSN applications in terms of reliable service delivery.

### **Keywords**

802.11; 802.15.4; Channel Interference; Mobile WSN; Resource Allocation