TECHNOLOGY

Active Sensing for Dynamic Spectrum Access

OVERVIEW

Recently, due to the widespread adoption of wireless communication, the security of wireless systems has become an extensively researched topic. The ability to authenticate and classify wireless transmissions utilizing cryptographic methods at the physical (PHY) layer, as opposed to higher layers, is important, as it prevents wasteful processing of unintended transmissions and permits nodes to quickly authenticate legitimate users and recognize unauthorized users.

Researchers at the University of Maryland have developed a novel physical layer (PHY) fingerprinting method for orthogonal frequency division multiplexed (OFDM) transmissions, where side information is incorporated into the fingerprint design. This fingerprint message is only visible to aware receivers who explicitly perform detection of the signal, but is invisible to receivers employing typical channel equalization. Simulations show that the "channel-like" fingerprint embedding scheme achieves nearly 100 percent detection accuracy and 100 percent classification accuracy.

APPLICATIONS

- Dynamic Spectrum Access for spectral sensing
- Shared spectrum under IEEE 802.22
- Digital fingerprint messaging

ADVANTAGES

- Achieves nearly 100 percent detection accuracy and classification accuracy
- Low signal to noise (SNR) ratio – as low as 5-6 dB
- Efficient spectrum access under IEEE 802.22 for Wireless Regional Area Networks (WRAN)

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

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CATEGORIES

- Microelectronics
- Information Technology

EXTERNAL RESOURCES

- US Patent 9,538,040

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