Centre for Communication Systems Research (CCSR)

Mobile Devices Spectrum Sensing

An algorithm that delivers fast and reliable spectrum sensing of multi-carrier signals in very low signal-to-noise ratio (SNR) environment.

Background

Spectrum sensing is a signal-processing technique which autonomously exploits local vacant frequency bands. The architecture allows simultaneous search over multiple frequency sub-bands.

Benefits

- High reliability and spectral efficiency (high accuracy and sub-band level sensing).
- 95% in probability of detection (PD) and 5% in probability of false alarm (PFA) for -20dB SNR levels.
- Low latency (2 frames).
- Low computational complexity.
- Robust to physical impairments such as time and frequency offsets.

Applications

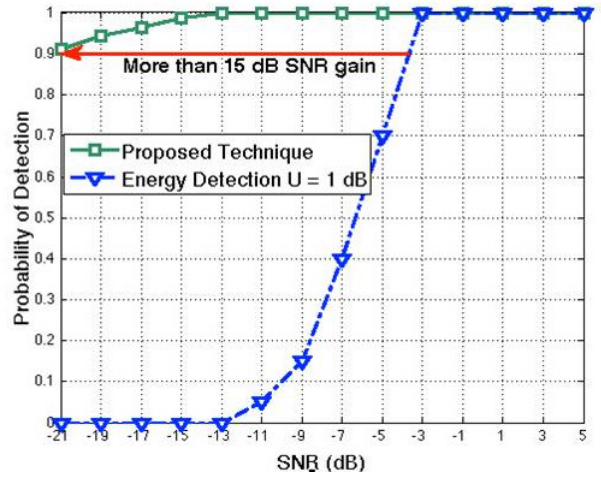
- Next generation of mobile networks (4G) such as 3GPP LTE and LTE-A and ITU-IMT advanced.
- Cognitive radios and systems including satellite, terrestrial or broadcast and military systems.

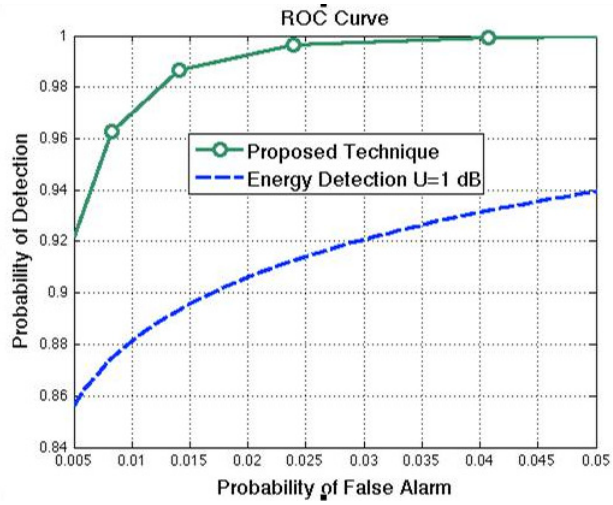
Uniqueness

This algorithm applies order statistics on the clustered differential energy-spectral-density (ESD) in order to exploit the channel frequency-diversity inherent in high data-rate communications.

IP

A patent was filed by the University of Surrey in April 2011 (Patent GB1105992.0).





Demo

Demo available at CCSR

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