Traditional wireless networks have been operating based on fixed spectrum assignment policies. According to these policies, licensees are granted the rights for exclusive use of frequency bands based on a long term basis over fixed geographical areas. This static allocation of the available spectrum resources, leads to several portions of the licensed bands being unused or underused at many times and/or locations. On the other hand, several technologies - such as IEEE 802.11, Bluetooth, ZigBee, and to some extent WiMAX - that operate in the ISM unlicensed bands, have experienced huge success and proliferation. As a consequence, the wireless spectrum they are accessing - especially the 2.4 GHz ISM band - has become overcrowded. In an effort to provide further spectrum resources for these technologies, as well as to allow potential development of alternative and innovative ones, it has recently been proposed to allow unlicensed devices, called secondary users, to access those licensed spectrum resources that are unused or sporadically used by their legitimate owners, called primary users. The technology that enables secondary users to find and opportunistically exploit unused or underused spectrum band is called cognitive radio. In recent years, cognitive radio has received extensive world-wide attention and significant advances in both research and applications have been achieved. Signal processing plays a key role in the development of cognitive wireless and mobile communications. The most important task in cognitive radio is the spectrum sensing which is mainly about primary user signal detection, a typical signal processing issue. The scope of signal processing in cognitive radio of course goes much beyond spectrum sensing and many challenging signal processing issues are to be solved for practical applications of cognitive radio.

The aim of this special issue is therefore to publish technical papers reflecting the most recent research and application results and identify new challenges in spectrum sensing and signal processing for cognitive radio communications. The following topical areas will be covered in this special issue:

- Spectrum sensing in cognitive radio
- Energy detection techniques
- Cyclostationary detection techniques
- Pilot-based coherent detection techniques
- Covariance-based detection techniques
- Wavelet-based detection techniques
- Distributed spectrum sensing in cognitive radio
- Cooperative signal detection techniques in centralised cognitive networks
- Cooperative signal detection techniques in decentralised cognitive networks
- Compressed wideband spectrum sensing in cognitive radio
- Filter bank methods for wideband spectrum sensing
- Non-uniform and time-varying filter banks for cognitive radio
- Signal identification and parameter estimation in cognitive radio
- Channel estimation and frequency synchronization in cognitive radio
- Interference cancellation and management techniques in cognitive radio
- Adaptive power control techniques in cognitive networks
- Signal design and spectrum shaping for spectrum sharing
- Signal processing in multiuser and dynamic spectrum access
- Signal processing in OFDM based cognitive radio
- Signal processing in MIMO based cognitive radio
- Reconfigurable signal processing architectures for cognitive radio
Procedure:

Prospective authors should follow the Guide to Authors of Papers for IET journals, which can be accessed at the IET Signal Processing journal website at https://scitation.aip.org/IET-SPR. Papers must be submitted on-line. Authors should indicate “Special Issue on Cognitive Radio” on their manuscripts. Enquiry can be made to the IET or the Guest Editors.

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