IEEE Open Journal of Vehicular Technology

Call for Papers for Special Issue on

Smart and Flexible Spectrum Technologies for Next Generation Wireless Communication Systems

Scope

The radio spectrum is the most important resource for wireless communication systems and a precious, scarce commodity in modern economies. The highly efficient exploitation of the spectral resources has motivated the evolution of the legacy static frequency allocation and management policies introduced in the early twentieth century towards more flexible and dynamic spectrum exploitation approaches in recent years. Gone are the days of the spectrum regulators' scepticism on dynamic spectrum sharing ideas, which has now been replaced with a supportive regulatory environment for flexible spectrum technologies. This significant change of paradigm in spectrum regulation and management has allowed the development of new technologies for flexible spectrum sharing and coexistence, both in licensed bands (e.g., WRANs in TV white spaces, LSA/ASA, CBRS) and unlicensed bands (e.g., LTE-U/LTE-LAA, 5G NR-U), and is also expected to facilitate and accelerate access to the radio frequency spectrum for a broad range of new applications and services in next generation wireless networks, including smart cities, smart grids, connected autonomous vehicles and drones in intelligent transportation systems as well as commercial and industrial IoT networks.

The concept of flexible spectrum usage has historically been developed in the context of the crowded lower frequency bands. However, over time there will be use of much higher frequency bands that are not currently used for communications. There is an opportunity to embed spectrum-sharing technologies in much higher frequencies (e.g., millimetre wave bands) as the technology opens up the possibility of using those. This will be necessary to enable an opportunistic use of mmWave bands currently in use by certain technologies such as radar and satellite systems as well as an efficient coexistence in new unlicensed spectrum in the 6 GHz, 60 GHz and above 95 GHz bands. This trend is backed up by the recent release of experimental licenses on a shared, uncoordinated basis to support research, innovation and the development and use of new products and applications in Extremely High Frequency (EHF) bands.

While flexible spectrum technologies offer the potential for increased spectrum efficiency and paves the way for futuristic application scenarios, interference protection in a dynamic spectrum management context remains the key challenge, in particular in next generation scenarios that require high capacity (e.g., holography and virtual reality), high density (e.g., closely spaced devices in factories and offices) and high precision (e.g., robotic assembly and warehouse stocktaking).

The purpose of this special issue is to bring together state-of-the-art research contributions that describe original work addressing the challenges faced by flexible spectrum technologies in next generation wireless communication scenarios. This special issue aims to solicit recent research advances in modelling, analysis, performance evaluation, simulations and experimental studies on smart, flexible and versatile technologies that provide promising research directions to improve the efficiency of spectrum utilisation.

Topics of Interest

The topics of interest of this special issue include, but are not limited to:

- Spectrum coexistence technologies for licensed and unlicensed bands
- Solutions for spectral coexistence between emerging and existing/legacy wireless systems
- Technologies to enable spectrum coexistence of active and passive users
- Spectrum technologies specifically designed for Vehicular Technologies
- Artificial intelligence (deep/machine/reinforcement learning) for smart spectrum access
- Optimisation of spectrum management for next generation application scenarios
- Algorithms and protocol design for enhanced spectrum exploitation
- Spectral awareness and signals intelligence techniques
- Spectrum sensing and sensor networks for flexible spectrum systems
- Wideband signal detection techniques for broad frequency bands (e.g., mmWave)
- Resource allocation for interference management/protection
- Software-defined radios for flexible spectrum usage
- Experimental prototyping, test-beds and field trials
- Flexible spectrum regulation and standardisation

Manuscript Submission Guidelines

Manuscripts must follow the author instructions available at: https://vtsociety.org/ojvt-author-instructions/. Manuscripts must be submitted via Manuscript Central: https://mc.manuscriptcentral.com/ojvt). Please select "Special Issue" in the first submission page under the pop-up menu "Manuscript Type" and select the correct title in the special issue topic list.

Accepted manuscripts will be published under the full/gold open access model subject to an Article Processing Charge (APC) of USD $1750 per article. IEEE members will benefit from 10% discount; members of the IEEE Vehicular Technology Society (VTS) will receive 30% discount. The journal has no page limits and no mandatory or over-length page charges.

Important Dates

Manuscript submission:	1 November 2021
First review notifications:	15 December 2021
Revised manuscript due:	15 January 2022
Final editorial decisions:	1 February 2022
Final manuscript due:	15 February 2022
Publication date:	1st Quarter 2022

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