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IEEE Journal of Selected Topics in Signal Processing
Special Issue on Signal Processing and Networking for Dynamic Spectrum Access

The paradox between the overly crowded spectrum and the pervasiveness of idle frequency bands in both time and space highlights the drawbacks of the current static spectrum allotment policy. Recently, we have witnessed a flurry of research activities in search for dynamic spectrum access strategies for improved efficiency. Approaches envisioned for dynamic spectrum access fall under three general models: dynamic exclusive use, open sharing, and hierarchical access. The dynamic exclusive use model aims to introduce flexibility to the current command-and-control spectrum regulation policy while maintaining the spectrum licensees' right of exclusive use. Specific approaches include spectrum property rights and dynamic spectrum allotment brought forth by the European DRiVE project. The open sharing model, also referred to as the spectrum commons model, draws support from the the phenomenal success of wireless services operating in the unlicensed ISM band. It employs open sharing among peer users as the basis for spectrum management. The hierarchical access model can be considered as a hybrid of the above two. The basic idea is to open licensed spectrum to secondary users and limit the interference perceived by primary users (licensees). One approach to spectrum sharing between primary and secondary users is spectrum overlay, also known as spectrum pooling or opportunistic spectrum access.

Each of these three models presents unique challenges in signal processing and relies on the integration of signal processing with networking for the efficient use of the limited spectrum resources. This special issue covers the diverse ideas and approaches envisioned for dynamic spectrum access. The underlying theme is to explore the role of signal processing in dynamic spectrum access and to illuminate the close interaction between signal processing and networking for spectrum efficiency. Original contributions are solicited from the following non-exhaustive list of topics.

- ☐ Modeling of spatial and spectral variations of signal strength for spectrum property rights
- ☐ Traffic prediction and allocation strategies for dynamic spectrum allocation
- ☐ Capacity analysis, spectrum sharing, and power control for spectrum commons
- ☐ Spectrum measurements and statistical modeling of spectrum usage
- ☐ Analysis and modeling of aggregated interference to primary users
- ☐ Fundamental performance limit of opportunistic spectrum access
- ☐ Distributed cooperative spectrum sensing
- ☐ The role of signal processing in cognitive networking protocols
- ☐ Regulatory policies and their interaction with signal processing and networking

Submission Procedure:

Prospective authors should follow the submission instructions available at http://www.ece.byu.edu/jstsp according to the following timetable.

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