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# Future Intent-Based Networking

On the QoS Robust and Energy Efficient  
Heterogeneous Software Defined  
Networks

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# Methods of Signal Detection and Recognition to Perform Frequency Resource Sharing in Cognitive Radio Networks

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## Abstract

The paper addresses the problem of spectrum sensing in cognitive radio networks and aims at improving efficiency of signal detection procedures by employing unconventional methods of signal detection and recognition. Such the methods allow us to reference unknown signals to a special class of signals for which no prior information is provided.

Conventional methods for signal sensing are as follows: (i) constructing adaptive decision rules based on fitting observed signals with typical stochastic models (like Gaussian and Rician). The main drawback of these methods is the lack of robustness to possible violations of initial model assumptions; (ii) testing signals for cyclostationarity. Despite their effectiveness such the methods rely on prior knowledge about spectral width of signal to detect and are computationally expensive; (iii) energy level detection, based on comparing signal's energy with a threshold, is easy to implement however it grants poor accuracy for low SNRs.

As of the moment the lack of efficient facilities of blind signal detection and radio emission type recognition slows down further progress in development and use of cognitive radio techniques. Thus the problem is urgent. The paper focuses on researching into the algorithms based on methods to detect changes in probabilistic properties of signals. Research is performed with respect to samples of real signals, typical for both VHF/UHF and the IEEE 802.22 frequency bands.

## Keywords

**Frequency, Sensing, Channel, Signal, Noise, Detection, Recognition, Resource, Sharing, Cognitive radio**