

Preface

With the exponential growth of wireless data services, the spectrum shortage becomes extremely severe. As a promising and new technology to break the spectrum gridlock, cognitive radio has received much attention in both academia and industry. In cognitive radio, spectrum sensing is crucial since it identifies the spectrum holes for secondary user transmission. This Springer Brief investigates advanced sensing techniques to detect and estimate the primary receiver for cognitive radio systems. Along with a comprehensive overview of existing spectrum sensing techniques, this Brief focuses on the design of new signal processing techniques, including the region-based sensing, jamming-based probing, and relay-based probing. The proposed sensing techniques aim to detect the nearby primary receiver and estimate the cross-channel gain between the cognitive transmitter and primary receiver. The performance of the proposed algorithms is evaluated by simulations in terms of several performance parameters, including detection probability, interference probability, and estimation error. The results show that the proposed sensing techniques can effectively sense the primary receiver and improve the cognitive transmission throughput.

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