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Sommario/riassunto	This SpringerBrief 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. Researchers and postgraduate students in electrical engineering will find this an exceptional resource.