



SPECTRUM SENSING IN COGNITIVE RADIOS UNDER NOISE UNCERTAINTY: DECISION MAKING USING GAME THEORY

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Abstract- Energy detection is best suited for the detection of licensed users when prior knowledge about them is unavailable. However, the presence of noise uncertainty refrains the use of energy detection for spectrum sensing. In this paper, we propose a refined energy detection (RED) which used dual threshold in the presence of noise uncertainty, and combine the concepts from game theory to achieve further performance improvements. The secondary user payoff is defined based on the primary user activity and the strategy adopted by the secondary user. The pure strategy Nash equilibrium and the best response for the mixed strategy Nash equilibrium are analyzed for all the possible strategies adopted by the secondary user. Simulations results show the effectiveness of the proposed algorithm in terms of greater secondary user payoff and robustness against noise uncertainty.

Index terms: Cognitive Radio, Spectrum sensing, Energy Detection, Noise Uncertainty, Game Theory.