

Design and Implementation of Probabilistic Methods for Spectrum Sensing in Cognitive Radios

Publisher: IEEE

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Abstract:

The paper deals with new unconventional methods of detecting unoccupied frequency channels in cognitive radios. The main feature of these methods consists in their ability of detecting unknown signals in the presence of noise under the condition of a priori uncertainty. It makes it possible to increase the efficiency of detecting unoccupied frequency channels in cognitive radios due to the fact that these methods track changes in the probabilistic properties of observations. During the course of spectrum sensing of the frequency range, the detected signals are divided into known (classified training samples of which are available in the system) and unknown ones. Application of methods for recognizing specified signals in the presence of unknown signals makes it possible to simultaneously avoid the erroneous occupation of a frequency channel by a secondary user, in the case when previously unregistered signal occurs, and also refresh the cognitive radio database. To detect unknown signals, only information about probabilistic characteristics of the channel noise is used.

Published in: 2022 IEEE Asia Pacific Conference on Wireless and Mobile (APWiMob)**Date of Conference:** 09-10 December 2022**DOI:** 10.1109/APWiMob56856.2022.10014247**Date Added to IEEE Xplore:** 17 January 2023**Publisher:** IEEE**► ISBN Information:****Conference Location:** Bandung, Indonesia