Abstract

Signal detection is a fundamental problem in Cognitive radio. In this paper a new statistical test is proposed based on random data matrix (RDM) for detecting the signals in noise, as opposed to the eigenvalue based tests. Among the many spectrum sensing methods, the RDM method detects the primary users without any prior information. The performance of the test is compared with energy detection (ED), covariance absolute value (CAV) and eigenvalue based algorithms through simulation analysis. This sensing algorithm can be used for very low SNR signal detection without requiring the knowledge of signal, channel and noise. Simulations are based on wireless microphone and identically and independently distributed (iid) signals.

References

- FCC, "Facilitating opportunities for flexible, efficient, and reliable spectrum use

- H. S. Chen, W. Gao, and D. G. Daut, &quot;Signature based spectrum sensing algorithms for IEEE 802. 22 WRAN,&quot; in IEEE Intern. Conf. COMM. (ICC), June 2007.
- Y. Zeng, Choo Leng Koh, and Y. Liang, &quot;Maximum eigenvalue detection: theory and application,&quot; IEEE International Conference on Communications, Beijing, 2008, pp. 4160-4164.
Keywords
Cognitive radio  Random data matrix  Spectrum sensing  Sphericity test  sensing algorithms