Joint Power Allocation and Constellation Design for Cognitive Radio Systems

ABSTRACT

- In this paper, we introduce a joint power allocation and constellation design algorithm for cognitive radios assuming spectrum sensing imperfections.
- The proposed algorithm minimizes the symbol error rate of the secondary user by designing optimized two-dimensional constellation points and assigning transmit power levels.
- The constellation points are assumed to be equally probable with zero-mean and unit average symbol energy.

EXISTING SYSTEM

- Cognitive radio is a smart software-defined radio that can adapt its transmission parameters, such as transmit power level and modulation type, based on the wireless channel conditions.
- The large volume of wireless traffic requires large bandwidth, however, the uneven distribution of traffic can cause the bandwidth to be under-utilized for average traffic loads or be insufficient for peak traffic loads and therefore cost ineffective.

PROPOSED SYSTEM

- The transmit power levels are assigned such that they do not exceed a predefined maximum transmit power threshold and that the interference resulting from the secondary user to the primary user does not exceed a predefined value.
- The outcomes of the proposed algorithm, which are constellation points and transmit power levels, can be stored in a lookup table that the secondary user can access to adapt its transmission parameters to the environment based on sensing decisions, maximum transmit powers, and interference levels allowed by the primary user.

HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

REFERENCE

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