USF Available Technologies

Technology Transfer Office

Cognitive Radio Transceiver for Dispersed Spectrum Utilization

Researchers at the University of South Florida have developed an innovative technique, referred to as dispersed spectrum utilization to exploit the efficiency of spectrum utilization.

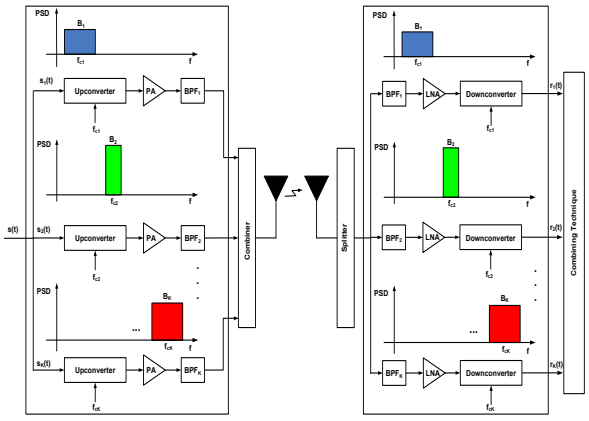
Spectrum is one of the most valuable resources for wireless communication systems and Cognitive radio (CR) is an emerging communication paradigm to address spectrum insufficiency by opportunistically accessing empty spectrum holes, also referred to as spectrum whitespaces. The available spectrum can be in the form of a single band (i.e. whole spectrum) or multiple dispersed bands (i.e. dispersed spectrum). All of the communication systems in the literature exploit the spectrum using whole spectrum techniques.

Our inventors propose an alternate way of utilizing the spectrum and exploiting the efficiency of spectrum utilization. The invented technique, which is referred to as dispersed spectrum utilization, is based on the idea of transmitting the information over multiple dispersed bands in contrast to the current wireless communication systems, where they transmit the signal over single band. A cognitive radio transceiver is developed for the implementation of dispersed spectrum utilization technique. In addition, an equation that facilitates the relationship between the conventional whole spectrum utilization and the invented dispersed spectrum utilization is derived. Theoretical and practical simulations are performed to compare the performance of both techniques in the context of location estimation in cognitive positioning systems. The results show that the performance of this technique is promising compared to the conventional techniques.

ADVANTAGES:

- **Exploits the efficiency of spectral utilization**
- **Utilizes different bandwidths for intelligent wireless applications**
- **Improved performance of personal, commercial and military wireless communication systems**
- **Increases the revenue of wireless service providers**

Innovative Spectrum utilization technique for intelligent wireless communication systems



Tech ID # 08A009 **Patent #: 8,064,836**

University of South Florida | Technology Transfer Office
813.974.0994 (office) | 813.974.8490 (fax)
patents@research.usf.edu
http://www.usf.edu/research-innovation/pl/