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Study of Cognitive Radio in Indian Communication Network

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Abstract **– In this research paper, we shall study cognitive radio in modern applications and systems in short range waves in India, OFDM is modern digital modulation scheme mainly used in Cognitive Radio, Effective utilization of available electromagnetic radio spectrum in our communication network is the main problem.**

Keywords **– Cognitive Radio, Indian Communication, Network.**

I. INTRODUCTION

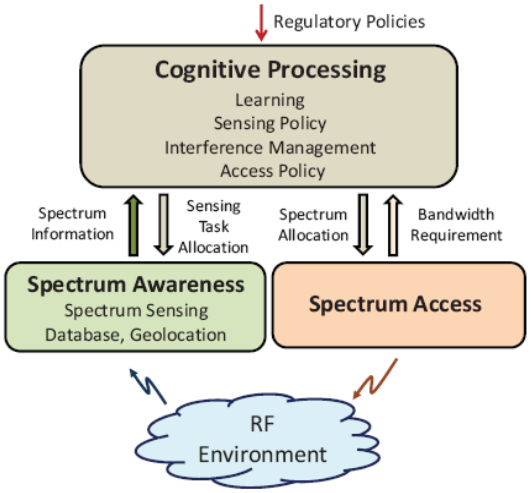
The electromagnetic radio spectrum is a powerful source for wireless communication network. Many studies on wireless communication network show that there is always vacancy in our electromagnetic radio spectrum. Our main problem is to fill the vacancy of electromagnetic radio spectrum. The cognitive radio modification of software-defined radio. Sense the environment, take decisions, and then give feedback to environment. Many research has proved that orthogonal frequency division multiplexing system (OFDM) has been proposed as a main candidate for cr's physical layer. Additionally performance of a wide band spectrum analysis can be supported by Fast Fourier Transform (FFT) in an OFDM receiver. Multitaper spectrum estimation method (MTM) is a non-coherent promising spectrum sensing technique. It has solved many problems of power spectrum estimation.

i) 0-87.5 MHz	Used for marine and aeronautical navigation, short and medium wave radio, amateur (ham) radio and cordless phones.
ii) 87.5-108 MHz	Used for FM radio broadcasts
iii) 109- 174 MHz	Used for Satellite communication, aeronautical navigation and outdoor broadcast vans
iv) 174-230 MHz	Not allocated.
v) 230—450 MHz	Used for Satellite communication, aeronautical navigation and outdoor broadcast vans
vi) 450- 585. MHz	Not allocated.
vii) 585-698 MHz	Used for TV broadcast
viii) 698-806 MHz	Not allocated.
ix) 806-960 MHz	Used by GSM and CDMA mobile services
x) 960-1710 MHz	Aeronautical and space communication
xi)1710- 1930 MHz	Used for GSM mobile services
xii)1930-2010 MHz	Used by defence forces
xiii)2010-2025 MHz	Not allocated
xiv)2025-2110 MHz	Satellite and Space communications
xv)2110-2300 MHz	Satellite communications and space
xvi) 2300-2400 MHz	Not allocated.
xvii)2400-2483.5 MHz	Used for Wi-Fi and Bluetooth short range services
xviii)2483.5-3300 MHz	Space communications
xix) 3300-3600 MHz	Not Allocated.
xx) 3600-10000 MHz	Space research, radio navigation
xxi) 10000 MHz	Used for Satellite downlink for broadcast and DTH services

II. COGNITIVE RADIO

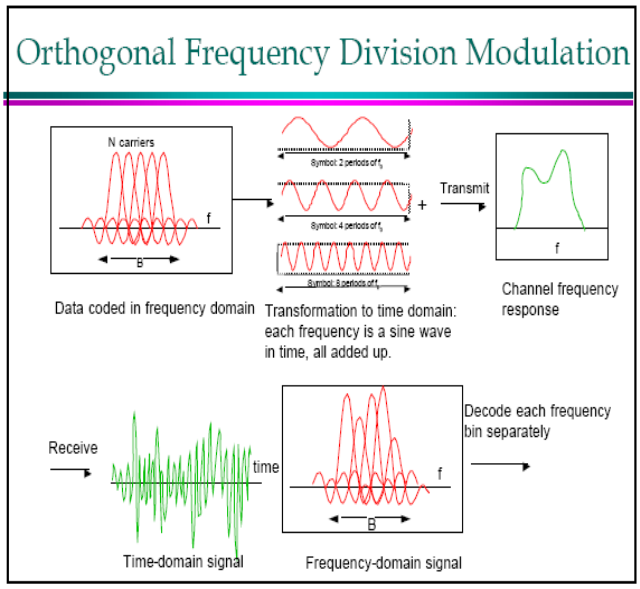
A basic cognitive cycle comprises of following three basic tasks:

- Spectrum Sensing
- Spectrum Analysis
- Spectrum Decision Making

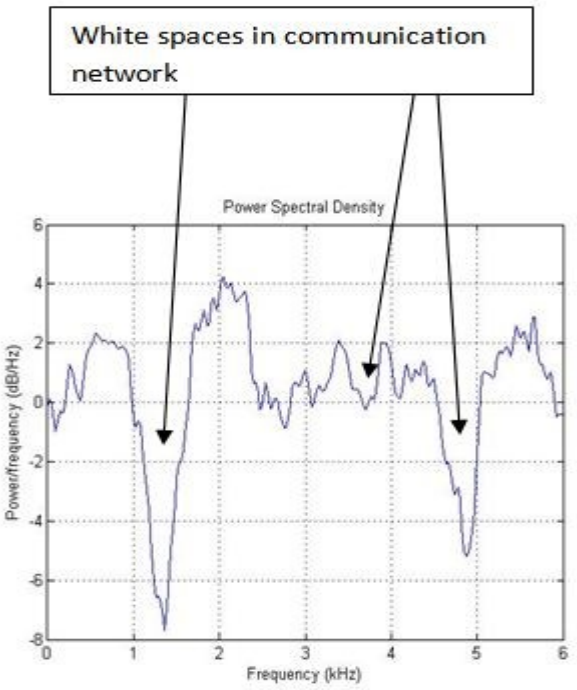


III. OFDM SIGNAL

OFDM transmits a large number of narrowband carriers, closely spaced in the frequency domain. In order to avoid a large number of modulators and filters at the transmitter and complementary filters and demodulators at the receiver, it is desirable to be able to use modern digital signal processing techniques, such as fast Fourier transform (FFT).



Example



IV. Conclusion

We can say that in India there is a large population, second after china. In same ratio there is a large communication network, in that network there is large amount of white spaces, so India is a good market of IEEE 802.22 standard based cognitive radio.

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