

A Tutorial on Cognitive Radio Principles and Spectrum Sensing

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Abstract

Cognitive Radio Network (CRN) is an all-intelligent radio network that supplants the traditional radio network. The major discrepancy that exists between the traditional radio network and cognitive radio network (CRN) is premised on the fact that; in CRN, all the white spaces (unutilized spectrum) are utilized maximally to the best of the available information at its disposal. The main advantage of the cognitive radio network is that it has the ability to sense and detect available channels from the spectrum frequency and alter the values used for transmission of data. This allows several unused spectrum frequencies to be fully utilized. Research on cognitive radio network (CRN) is still in its elementary stage. Therefore, there is a need for a thorough surveys and descriptions of the cognitive radio sensing mechanisms. The working behavior of the cognitive radio also needs to be revamped. This research work details the sensing and problems with interference in cognitive radio network. It also explains how and why the cognitive radio system is preferred to the conventional radio systems. There exist numerous technologies that are employed in the cognitive radio systems. Among these includes the Adaptive Radio and Software Defined Radio (SDR). The findings from this research have potential applications in areas such as cognitive-radio-systems design and implementations.

Keywords

Cognitive Radio, Radio Spectrum, Radio Transmission, Spectrum Sensing.

Biographies

Hussaini Adamu holds a Higher National Diploma (HND) and a Post Graduate Diploma (PGD) in Electrical Engineering at Federal Polytechnique Bida, Niger State and Beyero University Kano, Nigeria respectively. He is currently working towards his M.Eng. degree in Communications Engineering in the department of Telecommunication Engineering, Federal University of Technology Minna, Nigeria. His research area is cognitive radio networks.

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