Abstract

Radio resource management attracts great attention while utilizing available resources to provide users with enhanced system throughput. Radio resources management includes transmission power management, mobility management, and scheduling of radio resources.

For GSM, implementation of Fixed Channel Allocation (FCA) is discussed. A pathloss model used for this system is developed and it is used for implementation of FCA. A hypothesis for simulation model has been derived. The performance improvement in call dropping probability can be achieved by handling handoff calls through prioritizing. For evaluation of the performance of FCA and DCA, the blocking and dropping probabilities are calculated for reservation of channels for handoff calls.

In case of CDMA, there is constant growth in number of mobile users and also cell size is minimized to increase system capacity. Handoff rate is increased due to reduction in cell size. To overcome this problem, a new scheme, mutual frequency assignment (MFA) is proposed after studying different schemes. Efficient use of radio resources is very important, utilization of all resources have to be maximized. This is achieved using MFA.

The resource allocations in both the primary and the secondary networks is jointly considered, and then study of optimum transmission power and rate allocations for supporting best effort traffic in the CRN is done. Design of Interference Model for Scheduling Algorithm in Cognitive Radio Networks (CRNs) is presented. A method is proposed to compute throughput for optimal scheduling problem with an objective to achieve proportional fairness (PF) of the long term average transmission rates among different links, subject to the interference constraints within the cognitive network and imposed by the primary network.
An intelligent radio resource management is at the heart of LTE to make it a robust technology to meet the broadband mobility needs of upcoming years. This will schedule the available resource in a best way and provide to the users with the enough transmission capability to achieve the decided QoS, even while they move freely and also will make sure that these assigned resources would not interfere with already assigned resources.

Orthogonal Frequency Division Multiple Access has been adopted in emerging broadband wireless access networks such as 3GPP UMTS/LTE and IEEE 802.16x (WiMAX) due to its inherent immunity to inter-symbol interference and scheduling flexibility in resource allocation. This flexibility allows the exploitation of frequency, temporal and multiuser diversity offered by the wireless broadcast channel. By employing sophisticated multiuser scheduling algorithms, which transmit data to different users on favorable resources, a high system capacity can be achieved.

Static, semi-static and dynamic schemes are studied and Cyclic Switching Scheduling Scheme. (CSSS) is proposed. Different frequency allocation schemes to mitigate intercell interference are also studied.

3GPP LTE (Long Term Evolution) is the evolution of the UMTS which will make possible to deliver next generation high quality multimedia services according to the users expectations. Since the LTE performance evaluation and Radio Resource Management in 4G, needs system level simulations, different algorithms to simulate the LTE Downlink based on OFDM technology with Schedulers are presented in this thesis. These show that proportional fair and resource fair schedulers deliver a good trade-off between throughput and fairness.
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