CHAPTER 8

SUMMARY, CONCLUSION AND FUTURE SCOPE

In this work, techniques to automatically identify the unknown modulation technique using different techniques are implemented. This technique is practically implemented and tested for ten modulation types with hardware implementation on FL2440 ARM9 Embedded core. Additionally, the Modulation Identification Technique (using Slot Tracking) is implemented with a Scheduler and optimize performance based on the priority of a node, availability of the modulation scheme, channel characteristics etc. Self Healing data transmission is intrinsically performed using Hamming encoding Scheme. The data to be transmitted is Hamming encoded to enable error detection and correction at receiver and again implemented using HY-LPC1788 cortex ARM core.

The performance analysis of the Energy optimization suited to SDR is done and the obtained results confirm the suitability of schemes used to autonomously detect the adaptive modulation schemes. To enable the feature extraction for classifying modulation signals, amount of information is calculated from features of each sample taken from modulation signals. The radio system performance for increasing capacity is analyzed using channel support implemented for frequency and Time slot Modulation schemes. Frequency and time slot tracking is performed using scheduler based implementation and the results obtained using the scheduler algorithm shows the inclusion of priority in providing the time slots to be used by different nodes to perform guaranteed time slot communication.

Using Channel estimation calculation, the channel detection process is performed to determine the best suited modulation for that corresponding channel and determine the location of the dynamic node, Node tracking is performed using the intensity of the received signal. Shortest path algorithm is used to find the shortest link among the nodes in the dynamic channel.
The algorithm is implemented as a verilog core and tested for different combinations of source and destination nodes. To provide stable and efficient infrastructure for the implementation of different types of traffic in dynamic radio networks, adaptive node clustering technique is presented. Jitter analyses for the used topologies are studied.

The work includes the analysis of performance metrics such as co-channel interference, adjacent channel interference, number of channels supporting frequency based modulation and time slot based modulation and the number of users capable of utilizing the network with a good SNR. Analysis was performed with the density of overlay nodes and their variable level of participation in multicast algorithm to enable the reduction of message overhead. The energy saving calculation and effective bandwidth efficiency was done to illustrate the upgrading of adaptive modulation over conventional modulation.

Future scope can focus on accommodating more number of modulation schemes and increase the speed of detection. Also, for improving the performance, of error control, Khalifa et al., have proposed Reed-Muller codes alternate to Huffman codes. Reed-Muller codes algorithm is quite interesting because it manipulates the arithmetic operation on the matrices such as multiplication, modulo-2 addition and addition of the two matrices. To improve the longevity of the nodes and network, power controlling measures have to be initiated in MAC and Network layer. Work can also be improved on integration factors like congestion along with delay and throughput to enhance the overall network performance.