

ABSTRACT

Medical image data has a large data size and often lead to inefficient use of bandwidth therefore it necessary to use compression technique for efficiency bandwidth usage, in addition transmission medium has very limited bandwidth so that the development of telecommunications technology is starting to move toward BWA technologies (Broadband Wireless Access). WiMAX is one of the BWA standard introduced by the IEEE with IEEE 802.16 system. Base of WiMAX technology is OFDM which is a transmission technique that uses several frequencies are mutually perpendicular.

The use of compression techniques suited to the medical imagery is a lossless compression because the compression does not eliminate the importance of medical image data, so image quality remains the same despite the smaller image size. One example of lossless compression is Run Length Encoding. In the transmission process of WiMAX technology can use the techniques of error correction channel coding techniques to solve various problems caused by multipath fading channel conditions and noise. One type of Forward Error Control is a Turbo Code which has the advantage of using the minimum power at each modulation thus allowing transmission of signals with very low power levels.

From the simulation results as a whole to obtain quality BER of 10^{-4} , the use of turbo code and code rate 1/3 required 5.75 dB SNR. Effect of variations in channel coding of turbo code combined with the AWGN channel and code rate 1/3 gives the SNR of 7dB. In multipath channel with the addition of a turbo code encoding combined with a code rate 1/3 gives the SNR of 7.2 dB for BER 10^{-2} . Image quality in ideal channel coding using turbo code combined with the use of the AWGN channel and code rate 1/3 has the largest PSNR value of 40,0044 and 2,5487 which is the smallest RMSE. In the actual conditions of use multipath channel with the addition of a turbo code encoding combined with the use of code rate 1/3 has the second highest PSNR is 32,9253 and the second lowest RMSE value of 5,7580.

Keyword : *Bandwidth, Forward Error Control, BER, Turbo Code, Run Length Encoding*