

ABSTRACT

Video Compression is an important technology in a Broadband and Multimedia Service nowadays. Video Compression system that created a big compression ratio without reducing the quality of the entire video is really needed to make a better service for a Broadband and Multimedia right now or even in the future. Motion Compensation is a kind of interframe compression method which can reduce the temporal redundancy from the video. Furthermore, The interframe compression method that reducing the spatial redundancy is Wavelet Transformation and Vector Quantization based on Genetic Algorithm.

This Final Project implemented the use of Motion Compensation as the interframe compression method and Wavelet Transformation and vector quantization based on Genetic Algorithm as the interframe compression method. The performance's parameter of the system are ratio of compression, Mean Square Error (MSE), Peak Signal to Noise Ratio (PSNR), and Mean Opinion Score (MOS). The performance is analyzed based on input variables. They are decomposition level of haar wavelet, number of vectors in a cluster on codebook generating at vector quantization, and size of macroblocks that is used at motion compensation.

The system's testing results shows that, in intraframe compression, the maximum ratio compression is 93,96 %, the minimum MSE is 52,67, and maximum of PSNR is 30,95 dB, else for interframe compression, the maximum ratio of compression is 92,93%, the minimum MSE is 30,80 and maximum of PSNR is 34,15 dB. The average of ratio compression from all the scenarios from the tested video is 80,176%. It also shows that increasing of decomposition level will be proportional with increasing of compression's ratio and MSE, but it will decreasing the value of PSNR. The greater number of vectors in a cluster will result the greater compression's ratio and MSE, but it will decrease the value of PSNR. And the greater macroblock's size is used will result the greater compression's ratio and PSNR but it will decrease the value of MSE. The usage of clustering with ant colony algorithm or bee colony algorithm, and also the usage of adaptive block matching algorithm besides ARPS are suggested on this final task, so that the performance of the system will be more optimal.

Keywords : video compression, motion compensation, wavelet transformation, vector quantization, genetic algorithm