

ABSTRACT

The necessity of multimedia's files in large numbers, such as video, needs large memories too. Therefore, a suitable compression method is needed to make a high compression ratio but not to decrease the quality significantly.

Video can be seen as a group of frames. Similarity between two successive frames results a temporal redundancy. Motion compensation is an interframe compression method which can reduce the temporal redundancy in the video. The reference frame (I-frame) contains entire information of an image. Correlation between pixel with the others around results a spatial redundancy. An intraframe compression method is needed to exploits that correlation in a frame. Transformation and quantization method which exploits spatial redundancy in a frame is wavelet transformation and vector quantization.

This final task will implement the motion compensation as interframe compression method and wavelet transformation with vector quantization as intraframe compression method in a video compression's system. The performance's parameter of this system are ratio of compression, Mean Squared 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 wavelet, numbers of vector in a cluster on codebook generating at vector quantization, and size of macroblocks that are used at motion compensation.

The system's testing results show 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 genetic algorithm and 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.*