ABSTARCT

In today's information technology, the image or image component is a very important component. Low resolution images provide limited information. Therefore, an image quality improvement process that can perform Super-Resolution reconstruction is carried out in order to develop new technology to improve image quality so that it is easy to recognize existing objects.

Image quality improvement research carried out in this final project uses the EDSR (Enhanced Deep Super-Resoluiton Networks) method without a convolutional autoencoder process with 6 layers plus a Resblock layer and EDSR with a 12 layer convolutional autoencoder process plus a modified Reblock layer and tested to see the performance of PSNR and SSIM each of the running system models. This method is designed so that image quality improvement has better performance than the EDSR method without the convolutional autoencoder process

The final results obtained using the EDSR method with the convolutional autoencoder process can improve image quality, then from the results that have been analyzed, using the DIV2K dataset as training data and 5 types of datasets for testing. The results of testing and analysis of 2 PSNR and SSIM parameters obtained the results of testing and analysis of 2 PSNR and SSIM parameters, the average results of PSNR 34,761 and SSIM 0.929 for the Original EDSR model, PSNR 16,912 and SSIM 0.674 for the modified EDSR autoencoder model 1, and PSNR 21,985 and SSIM 0.697 for the EDSR autoencoder modification 2, with a filter value of 64 and a residual block value of 32 using the Adam optimizer, with a learning rate of 0.0001 epoch 75 steps per epoch 100, on the modified EDSR autoencoder model 2, so that the modified EDSR autoencoder model 2 outperforms the EDSR model. Autoencoder modification 1 uses the Set5 dataset, which shows image output with better image quality performance than low resolution, but cannot approach EDSR without the (original) autoencoder process, due to the limitations of the equipment used.

Keywords: Image enhancement, Image quality improvement, Super resolution, autoencoder.