Abstract

In this time digital image become important thing and useful in many area of our life and it make the need of digital image become much more and various. Very often reparation of damage digital image is needed because the limit of acquisition tool these day. Environment and acquisition tool which is not ideal will result damage to digital image in the form of blur and noise.

In this final project, digital image will be degraded using Gaussian noise and Gaussian blur, then restoring using Hopfield network that one of branch from Artificial Neural Network which including unsupervised learning category.

First, parameters calculated by comparing energy function from Hopfield network with error function. Then restoration algorithm applied, using iteration algorithm for minimization of energy function from Hopfield network or updating neuron until nothing updating neuron.

In analysis process conducted by comparison between original Hopfield network (JHO), sequential Hopfield network (JHS) and modified Hopfield network (JHM). For the calculation performance of image restoration, used PSNR, SNR and similarity.

Totally, image restoration performance of PSNR, SNR and similarity, JHM more better than JHO and JHS. Other specialty of JHM is degraded image restoration process more faster than JHO and JHS, because energy function of JHM is more faster convergent to minimum or updating neuron more faster until updating neuron no more.

Keywords: *gaussian blur, gaussian noise, hopfield network, PSNR, similarity, SNR*