ABSTRACT

Sampling theorem proposed by Harry Nyquist and Claude Shannon stated that the signal can be reconstructed perfectly if the signal sampling frequency is more than twice the maximum frequency of the original signal. But the statement of this theorem is very weak when used in real world applications because the signal has a limited bandwidth is not likely to be found. Signal which has a limited bandwidth is a pure sinusoidal signal at a frequency limited.

In contrast to classical sampling, the information content of the signal in the compressive sensing is no longer determined by the number of signal frequency components, but from the level of sparsity or degrees of freedom K. Compression effect occurs because the signal was originally consisting of N samples can be reconstructed with sampling that is proportional to log (N). This Final Project implemented Donoho-Huo and Elad-Bruckstein Border as sparsity bounds on image compressive sensing.

The results obtained from the analysis is the largest average value of PSNR obtained when sampling is using DHB-EBB WHUP border, on image with 16x16 pixels is 62.51 dB, 32x32 pixels is 27.71 dB, and 64x64 pixels is 31.32 dB. In terms of computing time, use of implicit matrix modeling is more effective and efficient when larger size of the image is used.

Keyword: sampling, compressive sensing, sparsity, Donoho-Huo and Elad-Bruckstein Border