ABSTRACT

Baker Map is an permutation based algorithm, so as to randomize the order of the data. Digital image is very good encrypted using the Baker Map algorithm because the dimension of the digital image is always fixed. However, to produce a better Avalance effect in the encryption need some necessary steps such as adding feedback confusion. One of the structures for the confusion is the Feistel structure. The most famous algorihtm that based on Feistel structure is the Data Encryption Standard (DES) algorithm.

Therefore, to produce a better effect Avalance on Baker Map can be combined with the Feistel structure. To determine which Algorithm is better when used in a digital image, on this final project will be discussed about analysis and simulation comparation of symmetric cryptography based on feistel structure with baker map algorithm and DES algorithm for digital image.

From the simulation results showed that DES algorithm has the best value for the avalanche effect that is 100%, the best resistance to brute-force attack with average value $6.85x10^{11}$ years*, and the best MOS quality value with average value 4.51.Baker Map 1x8 pixel algorithm have the best accuracy for gaussian noise for parameter value 0.3, 0.5, and 0.7.Baker Map 8x8 pixel algorithm have fastest computational time with average time 51.4 second, and the best accuracy for salt & pepper noise for parameter value 0.3, 0.5, and 0.7. The bigger image resolution, the bigger PSNR score. For DES algorithm, the bigger Gaussian noise parameter value make the smaller MSE score. And for Baker Map 1x8 pixel algoritm and Baker Map 8x8 pixel algorithm, the bigger Gaussian noise parameter value make the bigger MSE score.And Salt & Pepper noise for all algorithm, the bigger Salt & Pepper noise parameter make the bigger MSE score.*

***Keyword** : Baker Map, Avalance Effect, Feedback, Confusion, Data Encryption Standard, Algorithm*