ABSTRACT

Visual sight information such as image or video is a kind of vast amount block data which require certain cryptographic algorithm offering high processing speed and also high security level. Cryptographic Algorithm based on Chaotic Kolmogorov Flows is one of the algorithm for processing image or video. This algorithm offers speed because only addition, substraction, and bit shift operation required. And it offers high security because it contains chaotic property.

In this final project, encryption and decryption process has been done for grayscale image with size 64 x 64 pixel in bitmap format file (*.bmp). Encryption process consists of two steps, permutation and substitution while decryption process also has two steps inversing the encryption process. Decrypted images have PSNR value between 47,5451 dB and 49,5893 dB, and average MSE Ratio 0,00086%. Decrypted images have picture quality between fine and excellent according to MOS criteria.

The HDL design used Active-HDL 3.5 software and synthesized with WebPack Project Navigator 5.1 software and hardware implementation target on FPGA Xilinx Spartan-II XC2S100-5TQ144C. Result from the implementation required 94% slices (1133 out of 1200), 55% IOBs (51 out of 92) and maximum frequency may used is 58.651 MHz for the encryption part. And for the decryption part also required 94% slices (1133 out of 1200), 55% IOBs (51 out of 92) and maximum frequency may used is 58.651 MHz.