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Secure Image Steganography with High Visual Image Quality Based on LSBM and Genetic Algorithm

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Abstract- The LSB matching method or LSBM is one of the simplest methods of steganography that has been proposed relatively successful attacks for its discovery. Visual image quality (imperceptibility) and lack of discovery by steganalysis attacks are two important criteria for any method of steganography. The main purpose of this paper is to provide a LSBM-based approach that is superior to LSBM in these two criteria. In the proposed method, the cover image is blocked and selected the best embedding sequence for each block using the genetic algorithm and the Linear Congruential Generator (LCG). The best sequence contains pixels whose LSB correspond most to data bits. The second step is to use the LSBM in the pixels of this embedding sequence. If the secret bit does not match the pixel's LSB, the pixel value should be incremented or decremented randomly by one unit. To make these random selections, a genetic algorithm has been used, so that the block has the least change in histogram compared to the original block. Comparing the parameter of visual image quality and the accuracy of the attacks in discovering this method, indicates the proper improvement of these criteria compared to the LSBM method.

Keywords- Steganography, Steganalysis, LSBM, Genetic algorithm, Linear Congruential Generator (LCG).