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Image Encryption Using Eureqa to Generate an Automated Mathematical Key

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Abstract : Applying traditional symmetric cryptography algorithms while computing encryption and decryption provides immunity to secret keys against different attacks. One of the popular techniques generating automated secret keys is evolutionary computing by using Eureqa API tool, which got attention in 2013. In this paper, we are generating automated secret keys for image encryption and decryption using Eureqa API (tool which is used in evolutionary computing technique). Eureqa API models pseudo-random input data obtained from a suitable source to generate secret keys. The validation of generated secret keys is investigated by performing various statistical tests (histogram, chi-square, correlation of two adjacent pixels, correlation between original and encrypted images, entropy and key sensitivity). Experimental results obtained from methods including histogram analysis, correlation coefficient, entropy and key sensitivity, show that the proposed image encryption algorithms are secure and reliable, with the potential to be adapted for secure image communication applications.

Keywords : image encryption algorithms, Eureqa, statistical measurements, automated key generation
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