

## Text Based Shuffling Algorithm on Graphics Processing Unit for Digital Watermarking

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**Abstract :** In a New-LSB based Steganography method, the Fisher-Yates algorithm is used to permute an existing array randomly. However, that algorithm performance became slower and occurred memory overflow problem while processing the large dimension of images. Therefore, the Text-Based Shuffling algorithm aimed to select only necessary pixels as hiding characters at the specific position of an image according to the length of the input text. In this paper, the enhanced text-based shuffling algorithm is presented with the powered of GPU to improve more excellent performance. The proposed algorithm employs the OpenCL Aparapi framework, along with XORShift Kernel including the Pseudo-Random Number Generator (PRNG) Kernel. PRNG is applied to produce random numbers inside the kernel of OpenCL. The experiment of the proposed algorithm is carried out by practicing GPU that it can perform faster-processing speed and better efficiency without getting the disruption of unnecessary operating system tasks.

**Keywords :** LSB based steganography, Fisher-Yates algorithm, text-based shuffling algorithm, OpenCL, XORShiftKernel

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