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Improving recovered image quality in secret image sharing by simple modular arithmetic

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1 Improving Recovered Image Quality in Secret Image
2 Sharing by Simple Modular Arithmetic

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10 **Abstract**

Shamir's polynomial based secret image sharing has been widely adopted to protect an image by splitting it into multiple shadows with $GF(251)$ calculation. However, mod 251 operation requires pixel values in the secret image to be modified into the range of $[0, 250]$, and leads to image distortion. In this paper, a method for improving recovered image quality in secret image sharing is proposed. To obtain computational efficiency, simple modular arithmetic on a prime number is still adopted. Pixels in the secret image are divided into non-overlapping blocks, and each block contains several N -bit subblocks. Modification strategies for different values of N are given to ensure that each subblock is fit for sharing, as well as theoretical analysis for choosing optimal N . Experimental results by the proposed method are demonstrated, illustrating improved recovered image quality and almost distortion free reconstructed image are achieved.

11 *Keywords:*

12 Secret image sharing, visual quality, polynomial, modular, finite field, distortion

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