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Sharing secret images using shadow codebooks

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Abstract

A practical specific (r, n) threshold scheme for secret digital images is proposed in this paper. By this scheme, we divide a secret digital image into n pieces and distribute them to n participants. The secret digital image can be reconstructed when and only when r or more participants cooperate for it. The time complexity of this proposed scheme is independent of the size of the secret image. In this scheme, the setup phase is bounded by $i \tilde{—} j \tilde{—} \hat{C}EŠr \hat{''} 1/2 \hat{C}EŠ + 2$ module multiplications plus $i \tilde{—} j \tilde{—} (r \hat{''} 1)$ module additions, where $i \tilde{—} j$ is the size of the codebook, except the time needed for generating the codebook. The reconstructing phase is bounded by $O(r \log^2 r)$. This scheme also achieves perfect secrecy.



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Keywords

Image compression; Lagrange's interpolation polynomial; Perfect secrecy; Threshold scheme; Vector quantization

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