Artificial Intelligence and Computer Vision

Editors (view affiliations)

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Particle Swarm Optimization Based Image Enhancement of Visual Cryptography Shares

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Abstract Due to the rapid growth of digital communication and multimedia applications, security becomes an important issue of communication and storage of images. Visual Cryptography is used to hide information in images; a special encryption technique where encrypted image can be decrypted by the human visual system. Due to pixel expansion the resolution of the decrypted image diminishes. The visual perception of a decrypted image can be enhanced by subjecting the VC shares to Particle Swarm Optimization based image enhancement technique. This improves the quality and sharpness of the image considerably. Suitable fitness function can be applied to optimize problems of large dimensions producing quality solutions rapidly. Results of the proposed technique are compared with other recent image enhancement techniques to prove its effectiveness qualitatively and quantitatively. The proposed algorithm guarantees highly safe, secure, quick and quality transmission of the secret image with no mathematical operation needed to reveal the secret.

Keywords Image enhancement · Particle swarm optimization · Image transmission · Visual cryptography · Information security · Secret sharing

1 Introduction

Information is the oxygen of the modern age. Valuing and protecting information are crucial tasks for the modern organization. In many applications information is sent in the form of images, as it requires less space and transmits more information. Due to the rapid growth of digital communication and multimedia applications,

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H. Lu and Y. Li (eds.), *Artificial Intelligence and Computer Vision*,
Studies in Computational Intelligence 672, DOI 10.1007/978-3-319-46245-5_3