## A NovelQR-Code Authentication Protocol Using Visual Cryptography for Secure Communications

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## ABSTRACT

Visual cryptography (VC) is a distinct type of secret sharing scheme which hides secret images in share images such that, when the shares are superimposed, a hidden secret image is revealed. It does not require the complex computational method to decode the secret information. The paper proposes a novel Quick Response (QR) code authentication system using Visual Cryptography. The passwords for authentication are encoded as QR-codes and later encrypted into share images. Thus, the share images by itself convey no information, but when the layers are combined, the secret password is revealed. The only necessary is that the user needs to handle a device containing a QR-code reader, most probably a Smartphone. The experimental result shows that the proposed QAP scheme provides secure data transmission with less computational complexity.

Keywords: Visual Cryptography, Visual Secret Sharing, Authentication, QR Code, Semantic

## **INTRODUCTION**

Information sharing over the World Wide Web (WWW) increases vastly. It implies the pressure on securing the information. Visual Cryptography (VC) is the new method to encrypt the image data in a better way. The basic idea of VC is to divide the original secret image into many partitions which are also called share images. Naor and Shamir [1] scheme describes the principles of Visual Secret Sharing (VSS), as shown in Table 1, to generate two share images by the perfect combinations of black and white pixels according to the secret image. G. Ateniese *et al.* [2] designed a novel technique to bring k out of n Visual Cryptography schemes but unable to get any secret information by stacking a less number of favorable shares. Wu *et al.* [3] scheme is to share more than one secret image in two random shadows. Ito et al [4] minimized the size of share images, by invariant visual secret sharing scheme. The schemes [1-4] are applied to binary images, which uses to carry out the work of generating shares with higher efficiency.

Model of Naor and Shamir [1] scheme		
Images	White Pixel	Black Pixel
Share 1		
Share 2		
Share 1 × Share 2		

 Table 1

 Model of Naor and Shamir [1] scheme

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