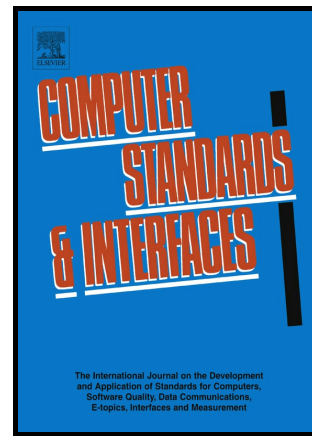


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# A new sharing digital image scheme with clearer shadow images

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## Abstract

Recently, Wei et al. propose a 2-out-of-2 sharing digital image scheme (SDIS) that shares a color secret image into two shadow images based on Boolean exclusive-or operation. There are three types of shadow images for Wei et al.'s SDIS: noise-like, black-and-white meaningful, and color meaningful shadow images. However, there exist some weaknesses in Wei et al.'s SDIS: the incorrect assignment of color palette data for the color index 255, the erroneous recovery in secret image, and the partial region in shadow image revealing the cover image. In this paper, we solve the weaknesses and propose a new SDIS. Experimental results demonstrate that our scheme effectively avoids these weaknesses.

**Keywords:** Secret sharing, digital image, color palette, Boolean exclusive-or operation.

## 1. Introduction

Sharing digital image by secret sharing technology is an important research area combining cryptography and image processing. A secret image is shared to some shadow images (referred to as shadows), which do not reveal any secret information. These shadows may be noise-like or meaningful (revealing a cover image on shadow). When shadows are combined in the prescribed way, the secret image can be recovered. Usually, this secret image sharing (SIS) scheme is implemented as a threshold  $(k, n)$ -SIS scheme, where  $k \leq n$ , that divides a secret image into  $n$  shadows. In a  $(k, n)$ -SIS scheme, we may reconstruct the secret image from any  $k$  shadows; but  $(k-1)$  or fewer shadows do not recover the secret image.

There are two major categories of SIS scheme: one is the visual cryptography scheme (VCS) and the other

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