Accepted Manuscript

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

Xiaotian Wu, Ching-Nung Yang, Yi Ting Zhuang, Shen-Chieh Hsu

PII: S0923-5965(18)30444-2

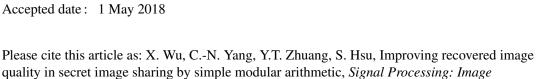
DOI: https://doi.org/10.1016/j.image.2018.05.001

Reference: IMAGE 15378

To appear in: Signal Processing: Image Communication

Communication (2018), https://doi.org/10.1016/j.image.2018.05.001

Received date: 5 September 2017 Revised date: 5 March 2018 Accepted date: 1 May 2018



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



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

Xiaotian Wu^{a,b,c}, Ching-Nung Yang^{d,*}, Yi Ting Zhuang^d, Shen-Chieh Hsu^d

^aDepartment of Computer Science, Jinan University, Guangzhou, China

^bNanjing University of Information Science & Technology, Nanjing, China

State Key Laboratory of Information Security, Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China

^dDepartment of Computer Science and Information Engineering, National Dong Hwa University, Taiwan

o Abstract

2

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:
- Secret image sharing, visual quality, polynomial, modular, finite field, distortion

Email addresses: cnyang@gms.ndhu.edu.tw(Ching-Nung Yang), wxt.sysu@gmail.com(Xiaotian Reprint submitted to Elsevier March 5, 2018

^{*}Corresponding author.

Download English Version:

https://daneshyari.com/en/article/6941454

Download Persian Version:

https://daneshyari.com/article/6941454

<u>Daneshyari.com</u>