

## Fully Incrementing Visual Cryptography from a Succinct Non-Monotonic Structure

### ABSTRACT:

Visual cryptography (VC) is a variant form of secret sharing. In general threshold setting, the  $k$ -out-of- $n$  VC allows that, in a set of  $n$  participants, any  $k$  can recover and reconstruct the secret by stacking their shares. Recently, the notion of multiple-secret VC has been introduced to embed multiple secrets. Region incrementing visual cryptography (RIVC) is referred to as a new type of multi-secret VC. RIVC defines  $s$  layers and takes  $s$  secrets, and then embeds each secret into each layer. The layers are defined by the number of participants; for example, let two secrets and two layers be  $S_2; S_3$  and  $L_2; L_3$  in 2-out-of-3 RIVC, where any two participants in  $L_2$  can recover  $S_2$  and three in  $L_3$  can recover  $S_2; S_3$ . However, there is another multi-secret VC, called fully incrementing visual cryptography (FIVC), which also has the layers, but only one secret  $S_i$  will reveal in one layer  $L_i$ . In this paper, our starting point is to propose a new notion of non-monotonic visual cryptography (NVC) for human vision system as a primitive to construct FIVC. We firstly present an ideal construction of simple NVC which relies on a slightly unreasonable assumption.

### INTRODUCTION:

Naor and Shamir introduced a variant form of secret sharing, called visual cryptography (VC) and sometimes also called visual secret sharing. In a visual cryptography scheme (VCS), for a set  $P$  of  $n$  participants, the shares are Xeroxed onto transparencies, and each participant receives one share from a dealer who generates shares from a secret image and distributes them. Let  $X$  be a qualified subset of participants. The participants in  $X$  can jointly reconstruct the secret image by stacking their shares without performing any computation.

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