

# Reversible Data Hiding in Images by MSB Prediction

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**Abstract:** Transmission of secret remote sensing or military photos has become more difficult due to the advancement of new media technology. Studying the technique for securing these secret photographs is a new and difficult endeavour. In this paper, a novel two-channel deep hiding network (TDHN) is designed based on the powerful spatial feature extraction capability of the convolutional neural network by introducing advanced ideas such as skip connection, feature fusion, and so on, and the two channels are used to simultaneously input the cover image and the secret image. There are two sections to this network: the concealment network and the extraction network. The sender employs the hiding network to conceal a secret image within a standard cover image, resulting in a hybrid image known as the hidden image. To extract and recreate the secret image from the hidden image, the receiver employs the extraction network. Meanwhile, two measures called MSE and SSIM are used to create a novel loss function. The TDHN optimised by the loss function may generate a high-quality concealed image and extracted image, according to the results. Between the concealed picture and the original cover image, the SSIM value is around 0.99, and between the extracted image and the original secret image, it's around 0.98. It has been proven through testing on various datasets that the developed and optimized TDHN has great generalisation potential, and so has significant theoretical and engineering utility.

**Keywords:** partitioning algorithm, error correction capacity, high security, Quick Response code, visual secret sharing scheme

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