# A New Rule for Cost Reassignment in Adaptive Steganography

## ABSTRACT:

In steganography schemes, the distortion function is used to define modification costs on cover elements, which is distinctly vital to the security of modern adaptive steganography. There are several successful rules for reassigning the costs defined by a given distortion function, which can promote the security level of the corresponding steganographic algorithm. In this paper, we propose a novel cost reassignment rule which is applied to not one but a batch of existing distortion functions. We find that the costs assigned on some pixels by several steganographic methods may be very different even though these methods exhibit close security levels. We call such pixels *"controversial pixel"*. Experimental results show that steganalysis features are not sensitive to controversial pixels, therefore these pixels are suitable to carry more payloads. We name this rule the Controversial Pixels Prior (CPP) rule. Following the rule, we propose a cost reassignment scheme. Through extensive experiments on several kinds of stego algorithms, steganalysis features and cover databases, we demonstrate that the CPP rule can improve the security of state-of-the-art steganographic algorithms for spatial images.

## INTRODUCTION:

STeganography is a technique for covert communication, which aims to hide secret messages into ordinary digital media without drawing suspicion. Designing steganographic algorithms for various cover sources is challenging due to the fundamental lack of accurate models. Currently, the most successful approach for designing content adaptive steganography is based on minimizing the distortion between the cover and the corresponding stego object. The distortion is obtained by assigning a cost to each modified cover element (e.g., pixel in the spatial domain image), and the messages are embedded while minimizing the total distortion which is the sum of costs of all modified elements. The first method based on the framework of minimal distortion

is HUGO (highly undetectable stego). HUGO defines the pixel's cost by the changing amplitude of the steg analyzer's features caused by modifying the current pixel, and pixels that make the feature vectors more deviated will have higher costs.