LSB BASED IMAGE STEGANOGRAPHY BY USING SECRET KEY

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LSB

suppose that

we have three adjacent pixels (nine bytes) with the following

RGB encoding:

10010101	00001101	11001001
10010110	00001111	11001010
10011111	00010000	11001011

Now suppose we want to hide the following 9 bits of data

101101101.

If we overlay these 9 bits over the LSB of the 9

bytes above, we get the following (where bits in bold have been changed) pixels:

10010101	00001100	11001001
10010111	00001110	11001011
10011111	00010000	11001011

PSNR

PSNR
is most easily defined via the mean squared error (MSE) which for two mXn monochrome images I and K where one of the images is considered a noisy approximation of the other is defined as

$$MSE = \frac{1}{mn}\sum_{i=0}^{m-1}\sum_{j=0}^{n-1}[I(i,j) - K(i,j)]^2$$

The PSNR is defined as:

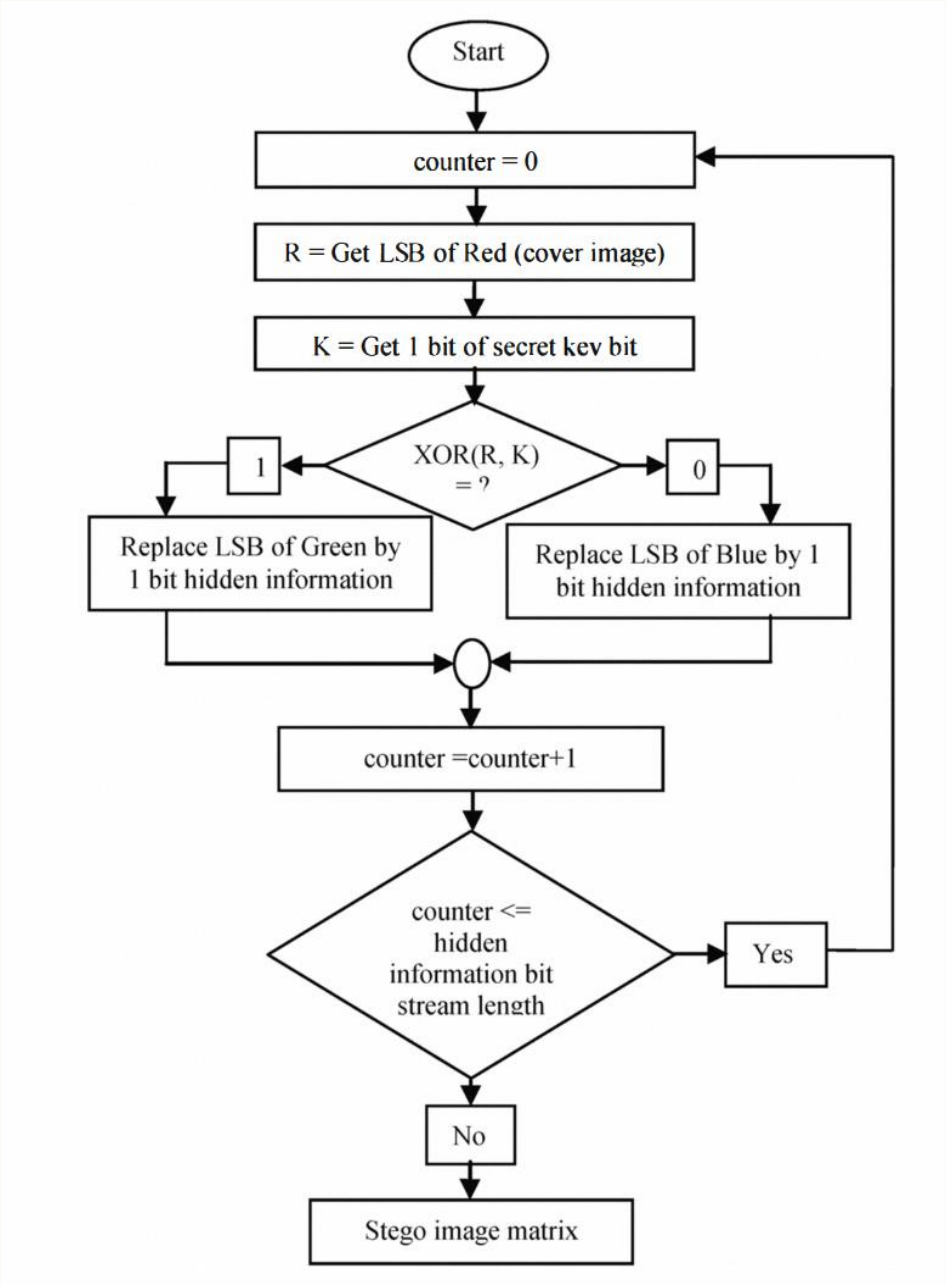
$$PSNR = 10.log_{10}\left(\frac{MAX_I^2}{MSE}\right) = 20.log_{10}\left(\frac{MAX_I}{\sqrt{MSE}}\right)$$

Larger PSNR indicates better quality of the image or in other terms lower distortion. The larger the PSNR value the smaller the possibility of visual attack by human eye

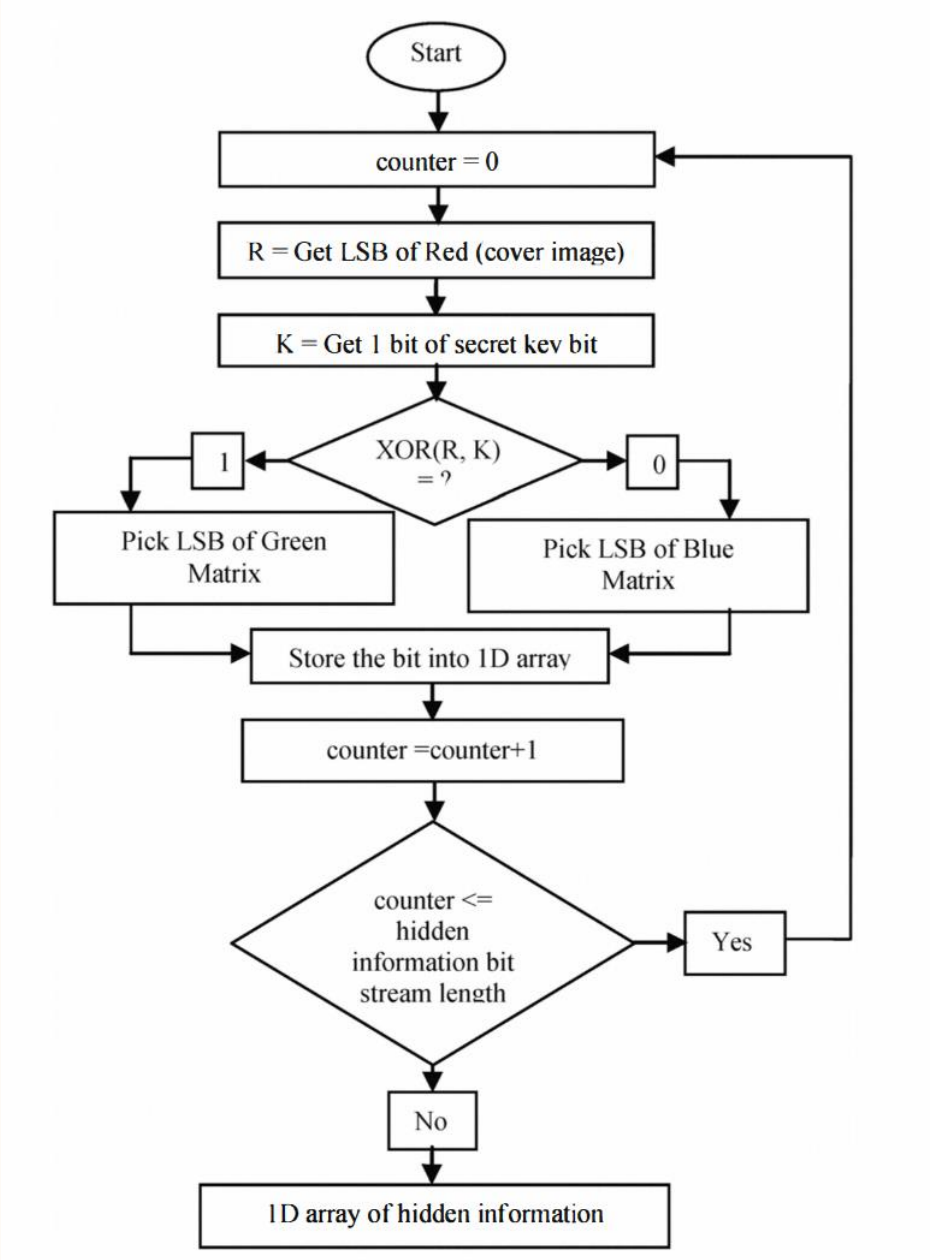
PROPOSED METHODS

cover image + secret key + hidden iriformation = stego image

The secret key is converted into
10 array of bit stream. Secret key and Red matrix are used only for decision making to replace hidden information into either Green matrix or Blue matrix. Each bit of secret key is XOR with each LSB of Red matrix. The resulting XOR value decides that the 1 bit of hidden information will be placed with either LSB of Green matrix or Blue matrix.



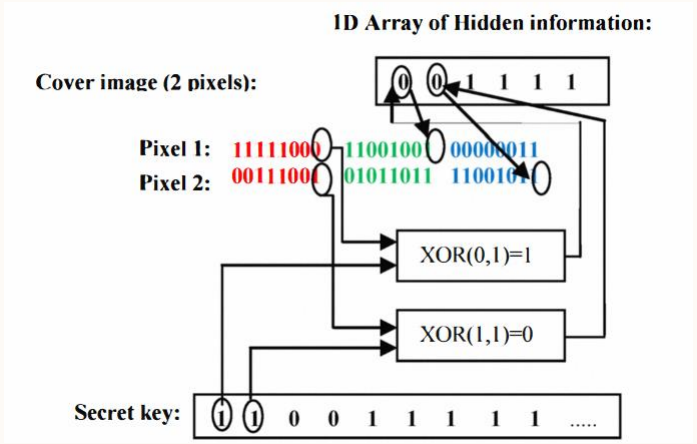
Flow Chart to hide hidden infonnation into cover image



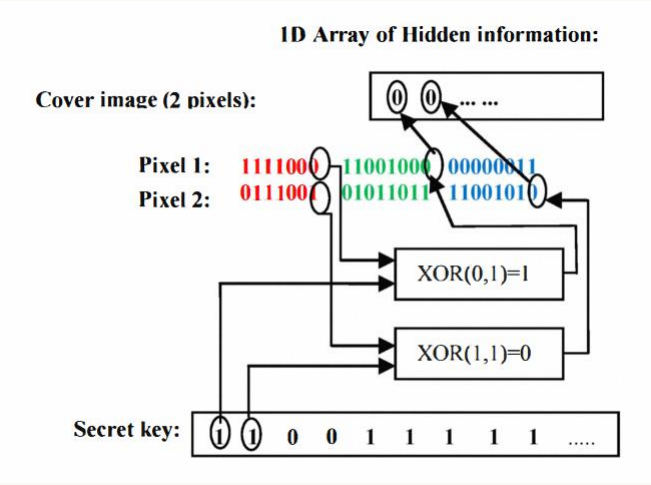
Flow Chart to recover hidden infonnation from stego image

Hiding Technique and Recovery Technique

ID ARRAY REPRESENTATION OF HIDDEN INFONNATION



Process to recover hidden infonnation from stego image



COMPARISON RESULTS WITH NA-J WU'S METHOD AND FOUR NEIGHBOR METHOD

Cover Images	PSNR (in dB) in Na-I Wu's method	PSNR (in dB) in Four Neighbor method	PSNR (in dB) in our method
Lena	34.3962	41.1468	53.7618
Baboon	30.413	36.5154	53.7558
Peppers	33.7496	41.0315	53.7869

END

Kosar shojaei