

# Removing Salt and Pepper Noise from the Image Using Threshold Mechanism

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## ABSTRACT

The digital image processing is the mechanism by which image is modified or quality of the image is improved. It may be required in order to transfer the data from one location to another. When data is transmitted from source to the destination then noise may be introduced within the image. The proposed system is going to handle Salt and Pepper noise which can distort the image. Median filter along with the threshold mechanism will be used to reduce the noise from the image. Threshold value will be the maximum values from within the image which will be compared against the obtain pixel values. If the values exceed the maximum values then threshold values will be retained.

Keywords: Threshold Mechanism, Salt And Pepper Noise , Digital Image Processing

## I. INTRODUCTION

The salt and pepper noise is one of the common types of noise that exist between the image transfer processes. This noise will be introduced when image is encrypted and then at the destination end it is decrypted. The encryption and decryption process will give rise to these kinds of noises. Also when temperature increases or decreases these noises will be introduced within the image. Salt-and-pepper noise is a form of noise sometimes seen on images. It presents itself as sparsely occurring white and black pixels. An effective noise reduction method for this type of noise is a median filter or a morphological filter. For reducing either salt noise or pepper noise, but not both, a contra harmonic mean filter can be effective. In the case of noise region is very complex. Complexity will be resolved using the technique known as threshold median filters which is a proposed scheme. In the previous papers salt and pepper noise is removed by the use of median filter. The suggested median filters are expensive in nature. Also efficiency of the median filter is also low. In the proposed work we will consider threshold values along with median filters. The cost of using this kind of filter is less as compared to median filter. The information of images which is presented to the median filter is reduced to threshold values. Hence median filter task is reduced. This will cause the

overhead to be decreased. The cost effectiveness and image smoothening will be the major task of the proposed work.

## II. METHODS AND MATERIAL

### A. Filters

Filters are used in order to reduce the noise from the image. The problem will start to appear when temperature rises. Filters will go to fail on high temperature. Hence noise will be present when temperature increases. There are following types of filters available to be used

#### Mean Filter

This filter is used to remove the noise from the image by taking the mean of the neighborhood pixels.

#### Median Filter

This filter is used to reduce the noise by taking median of the neighborhood pixels. Median can be obtained only if the data is presented in the increasing order.

#### Gaussian Smoothening

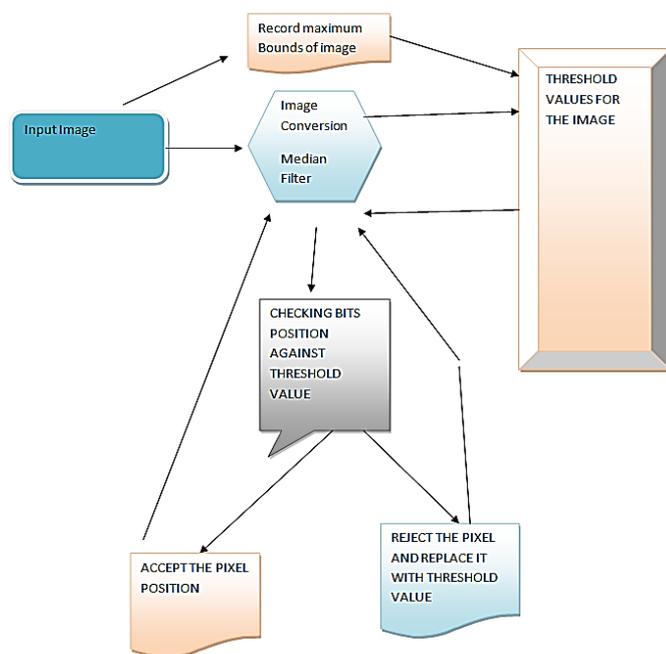
This filter will use Gaussian Smoothening Kernel. This is a good method to reduce the noise from the image. But this method is relatively complex in nature.

## Frequency Filters

The frequency filters will also use in order to remove the noise from the image. The noise reduction can be done either by the use of low pass or high pass filters.

## B. Proposed Model

The proposed model will going to use the concept of median filter along with the mechanism of the threshold. The spikes within the image can be reduced when pixels exceeding the threshold are eliminated. The proposed model will be described through the following figure.



**Figure 1.** Proposed Model for Reducing Salt and Pepper Noise

## III. RESULTS AND DISCUSSION

The proposed model first takes the input as image and converts them into bits and bytes. Threshold values are noted from the image. Comparison operation is performed in order to determine whether the image pixels are inside the image boundaries or not. If it lie outside the image boundary then the image pixel will be rejected.

### Proposed Algorithm

The algorithm describes the step by step representation of the logic. If these steps are performed successfully

than desired result will be obtained. The series of steps which are used are as follows

$$X = \{x_1, x_2, x_3, \dots, x_N\}$$

X will represent threshold values associated with the edges of the image. Threshold values will be provided by the user.

Procedure Threshold(X)

- a) Observe the values of the Boundary Pixels( $B_1, B_2, B_3, \dots, B_n$ )
- b) Compare these values with the threshold values(X)
- c) Set  $I=0$
- d) Repeat the following steps until  $I < N$ 
  - D1) if( $X_i < B_i$ ) then
    - $B_i = X_i$
    - End of if
  - D2)  $I = I + 1$
  - End of Loop
- e) Stop

## IV. CONCLUSION AND FUTURE WORK

The salt and pepper noise is a problem which is present within the image. The salt and pepper can be reduced by the use of median filter. The problem will start to appear when temperature rises. In order to solve the problem threshold values along with the median filter can be used. The threshold values will be the boundary values which are associated with the image. The pixels present within the image will be compared against the threshold values. If threshold values are exceeded by the image pixel values then those values are rejected. Hence salt and pepper noise from the image will be reduced. The overhead in the proposed model could be high which can be reduced in the proposed model.

## V. REFERENCES

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