

Survey On Noise Detection Method

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Abstract — Images are very useful source of information which is degraded in the presence of noise. Noises present in the image hides the important information. To retains the quality of the image need to remove noise. Noise refining is one of the important tasks of image processing techniques. Several denoising methods are proposed to improve the quality of image by removing different kinds of noises.

I. INTRODUCTION

The images are corrupted by impulse noise, this type of noise may appear in digital images because of channel decoder damages, communication links, video sensor's noises and other. The impulse noise called salt and pepper noise, causes white and black points appears in digital gray scale images, which chaotically scattered along image area. Applying of classic median filter for removal of such type of noise gives relatively good results, which could be shown in restoring of brightness drops, object edges and local peaks in noise corrupted images. And various denoising methods have been studied including traditional methods and fuzzy methods. The fuzzy image processing is a collection of all approaches that understand depiction and procedure the images, their segments and features as fuzzy sets. Depiction and procedure depends on the selected fuzzy technique and on the problem to be solved. If we want to define a set of gray levels that share the property dark. Fuzzy logic is built on structures of qualitative description used in everyday language, fuzzy logic is easy to use. A filtering system needs to be capable of reasoning with indeterminate and uncertain information this suggests the use of fuzzy logic.

II. RELATED WORK

Digital image plays a very important role in our day to day life in applications like Satellite television, medical image analysis, digital cameras, as well as in the areas of research and technology. On the process of image capturing and acquisition image sensors usually get affected by noise due to imperfect instruments, poor weather conditions, transmissions errors and compression. Thus image denoising becomes a pre-processing task in image processing before the image is analysed. Image denoising is

necessary to enhance the quality and structure of original image which has been degraded by noise. Noise can be modeled as Gaussian noise and Impulse noise (salt-and-pepper noise). Gaussian noise is uniformly distributed over the signal and salt-and-pepper noise; the noisy pixels can take only minimum (Zero) and maximum (One) value. Other types of noises are speckle noise, amplifier noise, shot noise etc.

Various restoration techniques has to proposed for the moving of impulse noise. Conventionally, linear filters produce serious image blurring while removing the impulse noise. Nonlinear techniques provide more satisfactory results than linear techniques. Nonlinear methods, including median filters, frame average or line average filters, rank-order filters, and fuzzy-logic-control filters with different computational complexities and memory requirements, can effectively remove the impulse noise and maintain sharp edges. A median filter requires a complicated ordering circuit for a large window size. Recently suggested median filters have, used a two-step digital image-processing scheme to filter out the impulse noise. In order to achieve the line map for impulse noise recognition, it requires one field buffer and three line-buffers.

Fuzzy image processing is the collection of all approaches and it is used to understand, represent and process the images, their segments and features as fuzzy sets. Base for fuzzy logic is the basis for human communication. The observation underpins many of the statements about fuzzy logic. Because fuzzy logic is built on the structures of qualitative description and it is used in everyday language, fuzzy logic is easy to use. A filtering system needs to be capable of reasoning with indefinite and uncertain information this suggests the use of fuzzy logic.

Study of Comparisons

Sl. No	Title	Author and Year	Proposed Technique	Algorithm used	Pros	Cons
1	A Survey on Fuzzy based Image Denoising Methods	Neha Agrawal, Dr. G. R. Sinha (2015)	Traditional filters and fuzzy filters.	Fuzzy logic based denoising algorithms, Gradient Detecting Fuzzy Logic Based Algorithms	It helps to remove various types of noises in image.	Applied methods take more running time to remove noises
2	A Fuzzy-Based Impulse Noise Detection and Cancellation for Real-Time Processing in Video Receiver	Chung-Bin Wu, Bin-Da Liu, Jar-Ferr Yan	Restoration & Non-linear techniques	Simple Fuzzy Based Algorithms	The proposed filter requires lower computational complexity than the later in hardware.	In order to avoid reducing the resolution of TV pictures in the direct replacement, which might possess the same disadvantage as most average filters
3	A Survey of Fuzzy Based Image Denoising Techniques	Mansi Pathak, Dr. G. R. Sinha (2014)	Fuzzy based Image denoising filters	Fuzzy weighted non-local means (FNLN) & NLM algorithm	Noise which does not fit within the optimal structuring element is effectively removed	Computationally expensive and many methods were proposed to accelerate it.
4	Review of impulse noise reduction technique using fuzzy logic for image processing	Jasdeep Kaur, Pawandeep Kaur, Preetinder Kaur (2012)	Mean filter (MF), Median filter, Rank conditioned median filter (RCMF), Arakawa's Fuzzy Median Filter (AFMF).	Mean algorithm, Median algorithm	Median filter (non-linear filter) is effective to reduce the impulse noise from the grayscale images.	Mean filter (linear filter) is just work on to reduce Gaussian white noise but does not work to reduce the impulse noise from the grayscale images.

III. CONCLUSIONS

To improve the image and simplify the computational complexity, a nonlinear filter, spatial image restoration, Fuzzy based Image denoising filters and so on. To evaluate the proposed algorithm, various percentages of impulse noise were added to the original images. Analysis of various techniques gives the result that NAFSM is able to outperform FIDRM filter in terms of PSNR, execution time and MSE. The NAFSM filter is able to suppress high-density of salt-and pepper noise, at the same time preserving fine image details and

edges. The NAFSM filter is able to yield good filtering results with efficient processing time even at high percentages of salt and pepper noise.

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