International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 09 | September - 2022 Impact Factor: 7.185 ISSN: 2582-3930

DETECTION OF SIGNAL TO NOISE RATIO FROM IMAGE CONTOUR -A MATLAB APPLICATION

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[ABSTRACT: Image is a combination of thousand number of pixels which is an integral unit of image , every pixel has three primary colors Red,Green,Blue. Contour means border detection of black and white image. Here in this paper our main aim is to reduce noise from black and white image after converting it from color image. Several noises are there, but we have used only few of them as an application to show you the procedure. Here we have added noise then applied filtering method to generate the contour and compared it with original contour of a normal noise free image. In each case original image has been displayed in result section.]

1.INTRODUCTION:

Here we have taken different types of colored image as an example , it is very difficult to obtain contour directly from colored image ; so we have to convert color image to black and white image , Contours can be explained simply as a curve joining all the continuous points (along the boundary), having same color or intensity. The contours are a useful tool for shape analysis and object detection and recognition. For better accuracy, use binary images. But here we have used gray image. But here the question is why to add noise before developing contour. Here we want to develop a contour image free from noise ; that's why before getting the contour we have used filtering method to make our gay image noise free. Here we have used two types of filtering techniques 1.Median filtering (no filtering coefficient is required) 2. Image filtering (need to set a filtering coefficient). Now the problem is to compare the two different contours of a same image after two different filtering methods ; in that case we need to see the original contour of the same image without any filtering. After that we can do any comparison of filtering methods. That's why we have used normal contour of the original image as a comparison parameter. Let's talk about the noise we have used in our programming to make the image noisy. But before adding noise it is desired that you should make image more

sharp. Then at the end we have found out the signal to noise ratio for all different contours. Matlab syntax is availabe and result is displayed in tabular form;

1. GAUSSIAN NOISE: Gaussian Noise is a statistical noise having a probability density function equal to normal distribution, also known as Gaussian distribution. Random Gaussian function is added to Image function to generate this noise. It is also called as electronic noise because it arises in amplifiers or detectors

2. SALT AND PEPPER NOISE: Salt-and-pepper noise, also known as impulse noise, is a form of noise sometimes seen on digital images. This noise can be caused by sharp and sudden disturbances in the image signal. It presents itself as sparsely occurring white and black pixels.

These two are very common noise found in image processing

2.PROCEDURES OF PROGRAMMING:

STEP1: Upload image in matlab

STEP2: Convert it to gray image

STEP3: Sharpen the image

STEP4: Add noise to the image

STEP5: Perform image filtering

STEP6: Find out the contour of the image with or without filtering

STEP7: All types contours must be plotted in a single output window

STEP8: Find out signal to noise ratio fro all types of contours

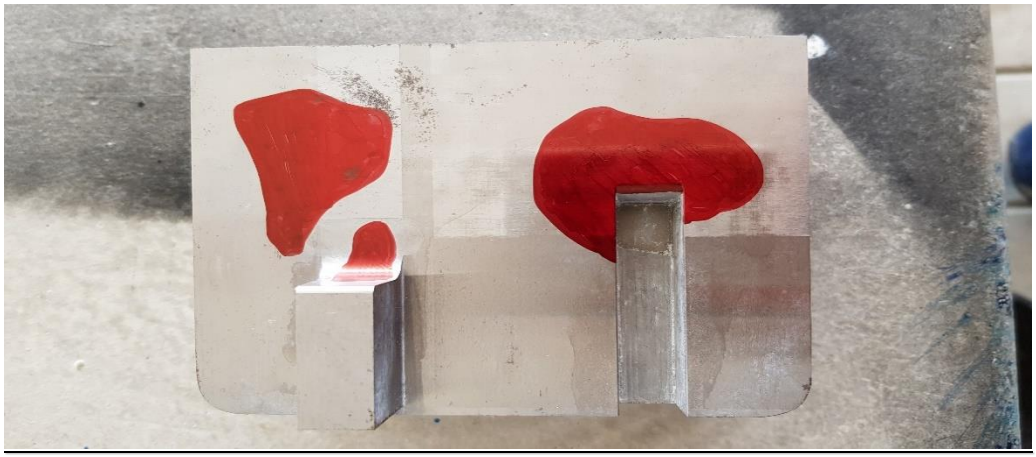
3.MATALB SYNTAX OF OPEARETION

OPERATION	MATLAB SYNAX
Upload image	Imread
Convert it to gray image	Rgb2gray
Sharpen the image	Imsharpen
Add noise to the image	Imnoise
Perform image filtering	Imfilter or midfilt2
Find out the contour of the image	Imcontour
Single window plot	Use subplot(x,y,z)
Signal to noise ratio	peaksnr, snr, psnr

4.RESULTS

IMAGE1

4.1ORIGINAL IMAGE 1



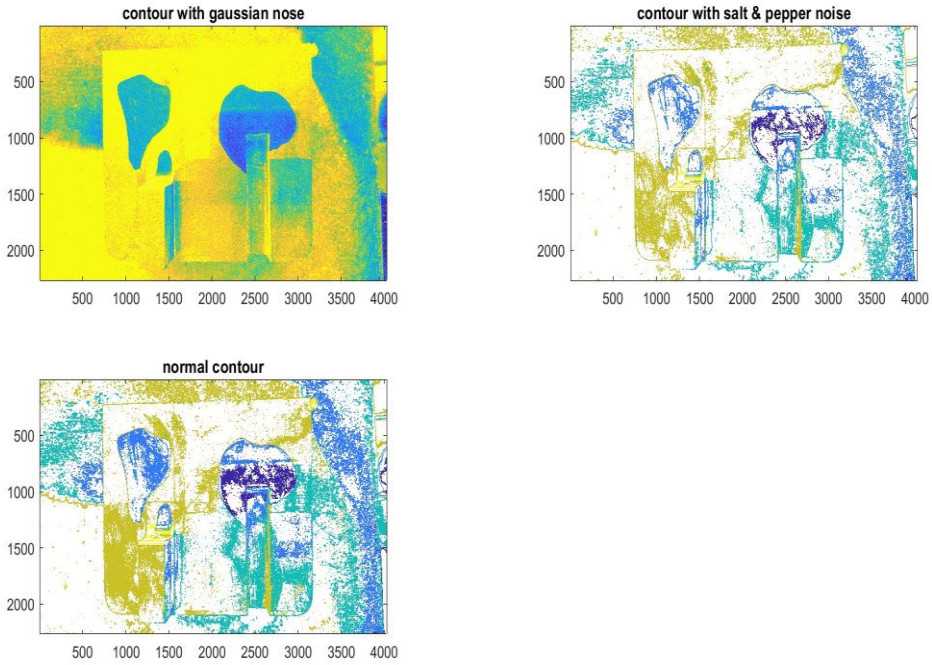
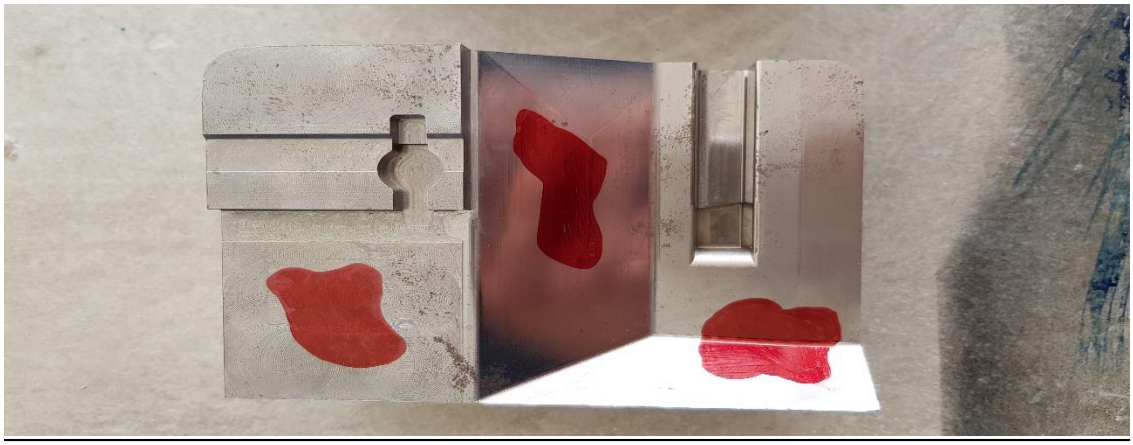
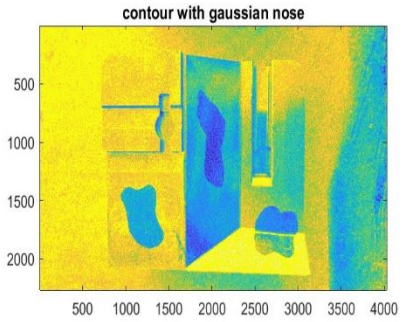
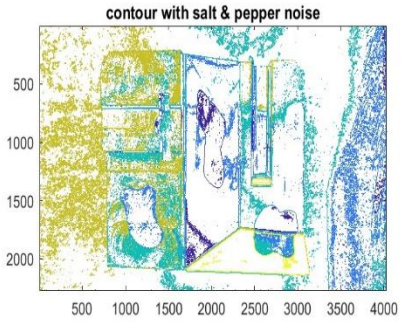


IMAGE2

4.2 ORIGINAL IMAGE 2







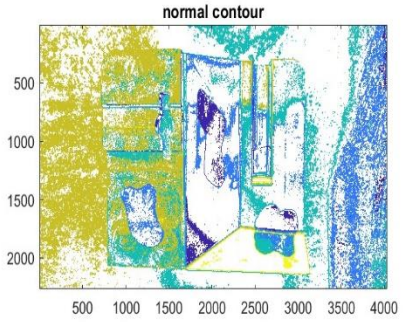
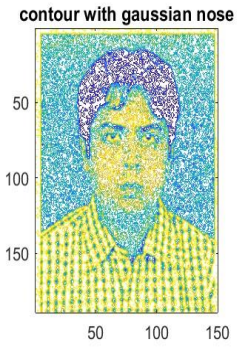
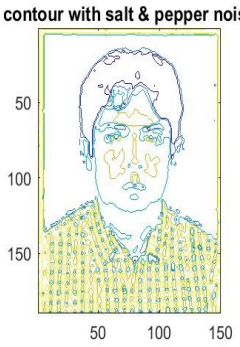


IMAGE 3

4.3 ORIGINAL IMAGE 3





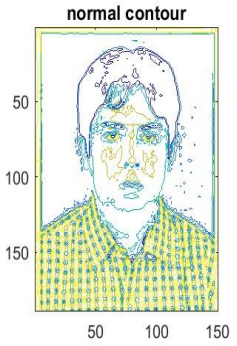
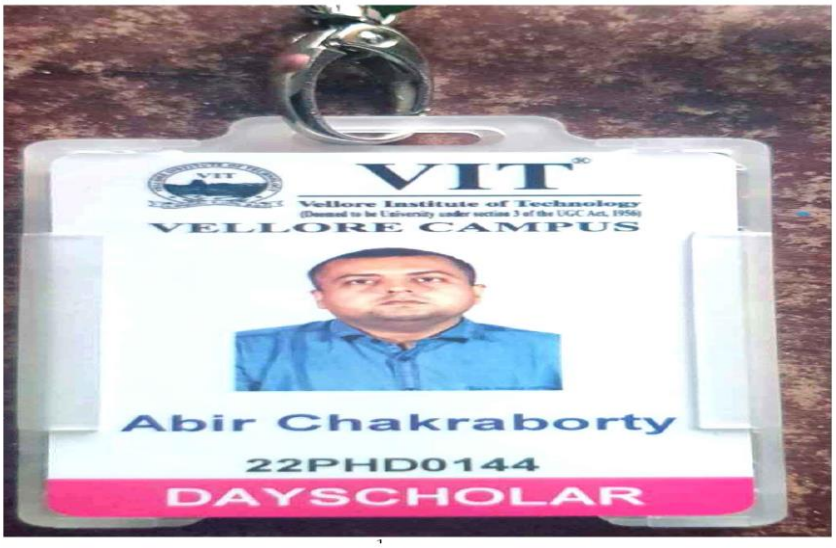
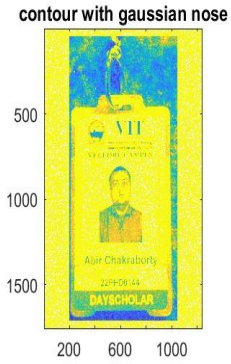
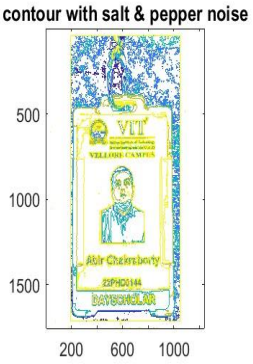


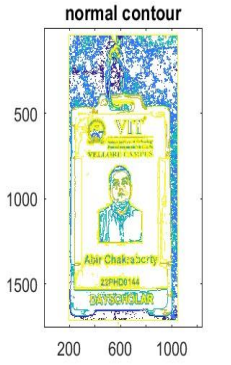
IMAGE 4

4.4 ORIGINAL IMAGE 4









4.5 SIGNAL TO NOISE RATIO TABLE

For your benefit we have calculated SNR for first three image

SL NO	SIGNAL TO NOISE RATIO		
	NORMAL CONTOUR	GAUSSIAN CONTOUR	SALT AND PEPPER
IMAGE1	19.8222	19.1480	19.4717
IMAGE2	19.6586	19.2906	19.4426
IMAGE3	19.8491	19.5004	19.7244

5.DISSCUSSION ON RESULTS

After observing and comparing the results of noise contour images with normal contour image of each cases we can conclude that salt and pepper noise contour image is more better than it's Gaussian counterpart . But the normal contour of each image is also better but in some cases the contour becomes noisy. For your convenience we have displayed you the original colour image.

6.CONCLUSION

Here we have used two very common noise ; syntax are available in matlab .But in future we want to use more complex noise to make a sharp and better contour. Definitely complex noise can be used in matlab. In case of normal contour image the signal to noise ratio is much higher. That means noise has effected contour plots.

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