ABSTRACT

Enhancement of a noisy image is a necessary task in digital image processing. To rectify the noise content in the natural image by adding known noise to the image before processing. So a simulated noise is added to the image just to understand the process of denoising. A filtering technique that can be applied to de-noise the images. After observing the results of quality measure values it concludes that filter works better in denoising the image in all chosen noise models.

With recent advances in image technology, image denoising has found renewed interest for researchers. Image denoising is one of the fundamental challenges in the field of image processing and computer vision, where the underlying goal is to estimate the original image by suppressing noise from a noise-contaminated version of the image. Image noise may be caused by different intrinsic (i.e., sensor) and extrinsic (i.e., environment) conditions which are often not possible to avoid in practical situations. Therefore, image denoising plays an important role in a wide range of applications such as image restoration, visual, tracking, image registration, image segmentation, and image classification, where obtaining the original image content is crucial for strong performance.

This study attempts the need of denoising database because raw image or noisy imagery database are not found due to that we make our own datasets and interpret the results on the empirical observations. The goal of de-noising is to remove the noise while retaining as much as possible the important signal features of an image. Different types of images inherit various types of noise and multiple types of models are used to present empirical work.

Denoising method tends to be problem specific and depends upon the type of image and noise model. The research in area of image denoising is revealing many techniques behind but most of the filtering techniques were work adhoc based to respectively on noisy imagery.

Noise reduction is the process of removing noise from images; each pixel in the image will be changed from its original values by a small amount. The plot of distortion of a pixel values against the frequency with it occurs, shows a normal distribution of noise, while other different noise tends to not approach to remove all
noise. A denoising algorithm is to achieve both noise reduction and feature preservation but due to limitation of methods it becomes blurring. A noise at different pixel can be either correlated or uncorrelated due to that noise modeling is very difficult task. The characteristics of the noise and the detail in the image, to better make those decisions.

• Real world signals usually contain departures from the ideal signal that would be produced by our model of the signal production process. Such departures are referred to as noise. Noise arises as a result of unmodelled or unmodellable processes going on in the production and capture of the real signal. It is not part of the ideal signal and may be caused by a wide range of sources, e.g. variations in the detector sensitivity, environmental variations, the discrete nature of radiation, transmission or quantization errors, etc. It is also possible to treat irrelevant scene details as if they are image noise (e.g. surface reflectance textures). The characteristics of noise depend on its source, as does the operator which best reduces its effects.

• Many image processing packages contain operators to artificially add noise to an image. Deliberately corrupting an image with noise allows us to test the resistance of an image processing operator to noise and assess the performance of various noise filters.

The significance of the thesis is to explore the effects of noise and design a new wavelet and compare with defaults wavelet family’s filters.

Most of the researcher worked on one or two RS images. We have taken 12 original images and made four basic types of noisy imagery to understand their effects and evaluate the performance. We have made our own RSNFI database which contains 673 images to study for noisy effects.

✔ The effect on noise on digital reconstruction and enhancement are determined from the statistics of the amount of alarm caused by the noise.
✔ Salt and Pepper produced by random noise in the intensity channel that affected for a particularly visible in flat fields.
Abstract

- Noise in the display spot deflection circuits that should be much effected result.
- The size of the image sensor, or effective light collection area per pixel sensor, is the largest determinant of signal levels that determine signal-to-noise ratio and hence apparent noise levels.
- Temperature can also have an effect on the amount of noise produced by an image sensor due to leakage.

We observe that, the performance of proposed naar wavelet filters with existing haar, db, sym, coeif, bior, rbio, rbio and dmey filters have tested and the context of noise denoising, the most relevant value is accuracy retrieved. Finally, we are compared our results with other researcher work which gives robust performance as compare to them.