# Project Notes

Monday, November 02, 2015
7:25 PM

## What is Noise ?

Image noise is random (not present in the object imaged) variation of brightness or color information in images, and is usual ly an aspect of electronic noise.

## Example :

**3 Criteria's for** (an area of uniform red in an image might have a very small black part.)

1. If this is a single pixel, it is likely (but not certain) to be spurious and noise;
2. if it covers a few pixels in an absolutely regular shape, it may be a defect in a group of pixels in the image-taking sensor (spurious and unwanted, but not strictly noise);
3. if it is irregular, it may be more likely to be a true feature of the image. But a definitive answer is not available.

## Image Example :

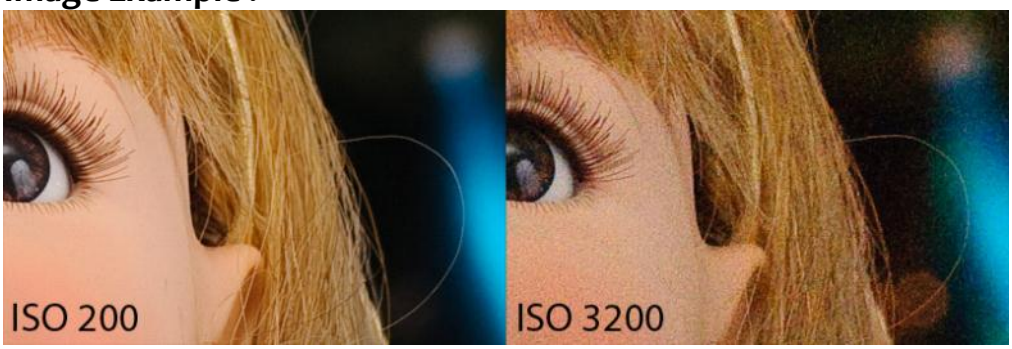


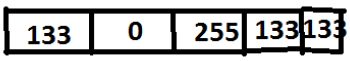
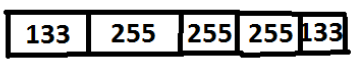

Fig : Noise (left one having less noise because of reducing ISO; right one having more noise because of increasing ISO)

## Noise Reduction:

**Linear Smoothing Filter:**

Here value of each pixel is set equal to the average value of its 8 neighboring pixels. This type of filter for noise removal is called linear smoothening filter. Such a filter is very effective in terms of performance and speed. Thus, this filter was selected for imp lementation on actual hardware.

## Algorithm:

| | |
|---|---|
| **Idilate** is a variable to store noise reduced image<br>**Igray** is a variable which stores a image in gray form | |
| Idilate = Igray; | // Equal Idilate with Igray (mostly for the boundary pixels as we do not process them) |
| for i = 1:rows<br>for j = 2:cols-1<br>temp = max(Igray(i,j-1), Igray(i,j));<br>Idilate(i,j) = max(temp, Igray(i,j+1));<br>end<br>end | // this for loop process every row in the image for noise reduction<br>  <br><br>  <br><br>Upper one is image before Noise reduction and Lower Image is After Noise Reduction |
| I = Idilate; | Equal I to Idilate |

## Real Example:

Image with Noise :

Image after Noise Reduction :