

# Automatic Adaptive Image Enhancement Algorithm in the Field of Medical science

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**Abstract-** The aim of image enhancement is to improve the perception of information in images for human viewers, or to provide 'better' input for other automated image processing techniques. There is no general theory for determining what 'good' image enhancement is when it comes to human perception. However, when image enhancement techniques are used as pre-processing tools for other image processing techniques, then quantitative measures can determine which techniques are most appropriate. Here we are proposing some enhancement algorithms based on spatial domain for better image analysis in medical field.

**Index Terms-** Adaptive Filters, Medical Images, Image Enhancement, X-ray, Fractures

## I. INTRODUCTION

Images captured by Medical Instruments are not good in quality and it requires some enhancement. There exist many techniques that can enhance a digital image without spoiling it. Presently, the enhancement methods available with the doctors are not classified according to the technique of imaging but common algorithms are applied to all images. But as every image is unique in terms of basic image parameters of Colour, texture and contrast, it's obvious that a same set of algorithms can't be applied to all images having different imaging techniques.

We have used different algorithms on images to enhance their perception for a human eye as well as machines. Our motive of applying these algorithms to these images was to arrive at a chain of enhancement algorithms which would best suite a particular type of a medical image and hence give our suggestions accordingly.

## II. PREVIOUS WORKS

Presently either the doctors use the images from medical images directly or at best apply a common set of some basic filters like average, median or gray scale on the images which again does not guarantees a better outcome. Images obtained after this transformations may be luckily good for some cases while for others this may even degrade the quality.

## III. Basic Idea

First step was to analyze the images from different instruments to find out the types of noise present in these images.

For example –

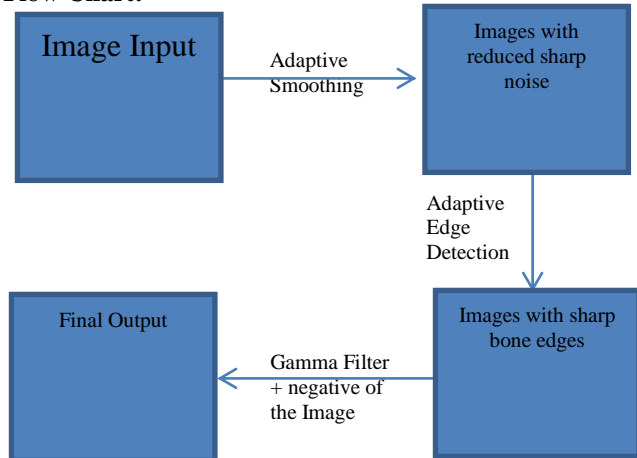
- Chest Radiography
- Mammography
- CT Scan
- MRI
- X-ray

Next we apply different set of optimizing and enhancing algorithms to increase the perception of images. Thus finally deriving what sets of algorithm should be applied for each category of these images.

## IV. PROPOSED ALGORITHMS

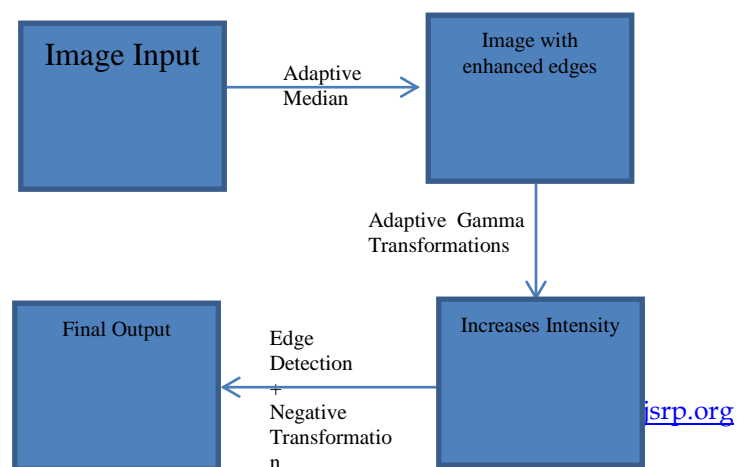
**Chest Radiography:** It is basically used to detect a small round blob in early stage of lung Cancer.

### Flow Chart:

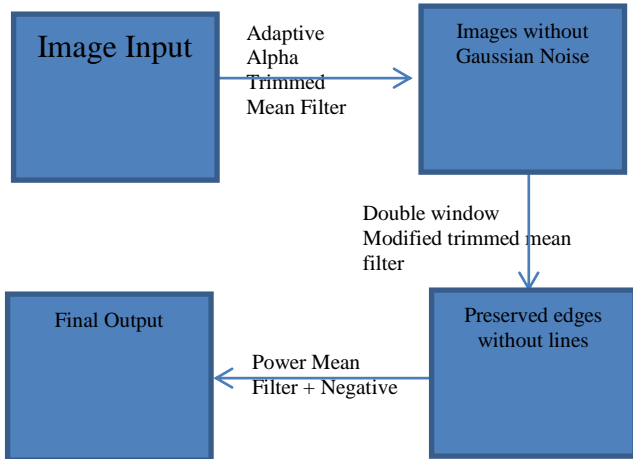


**Mammography:** Used to detect Breast Cancer.

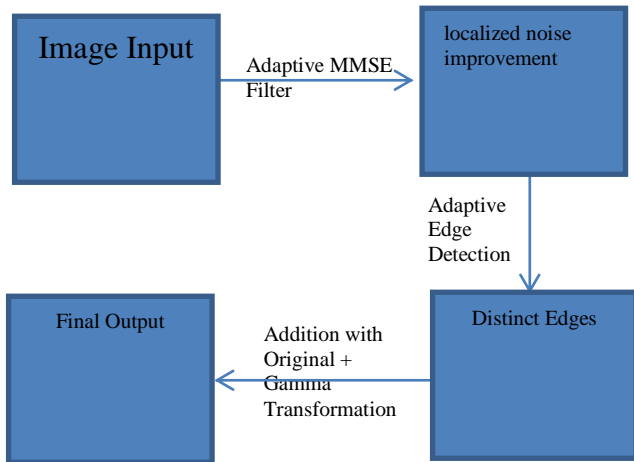
### Flow Chart:



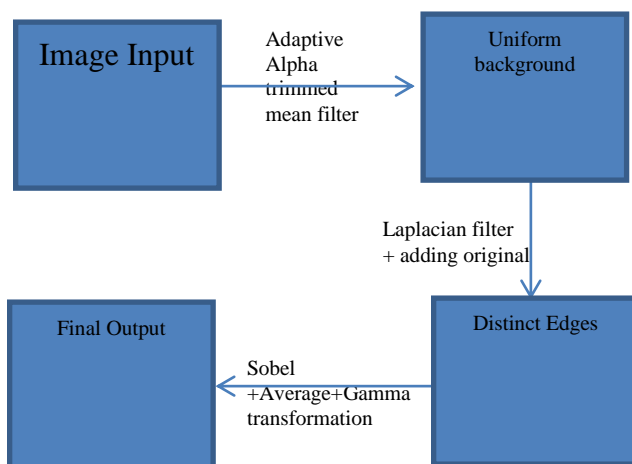
**CT Scan:** For detecting brain tumors.



**MRI Scan:** For detecting Psychological disorder.

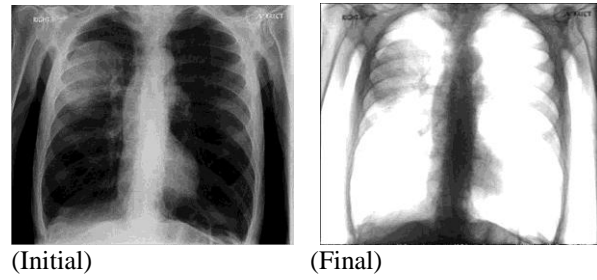


**X-Rays:** Used to analyze bone structures.

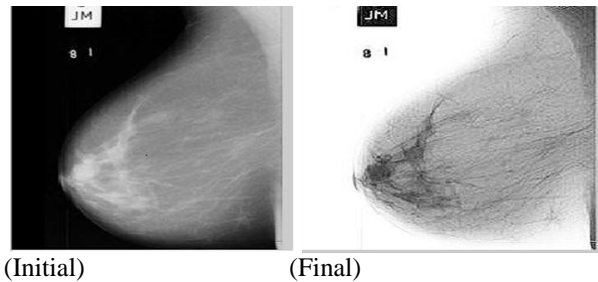


**V. RESULTS**

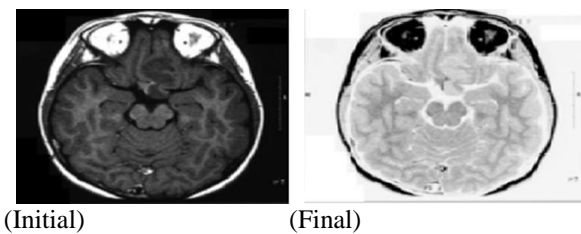
**Chest Radiography:**



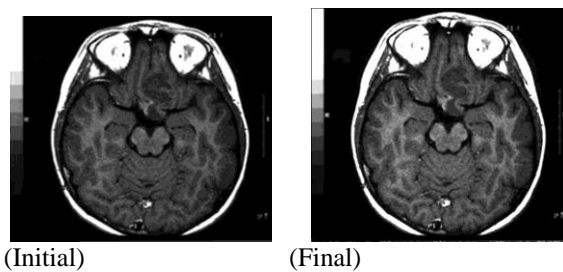
**Mammography:**



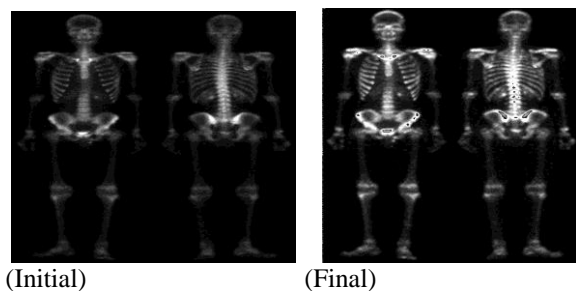
**CT Scan:**



**MRI Scan:**



**X-Rays:**



## VI. CONCLUSION

One can clearly see from the results obtained that the images were enhanced after the use of this algorithm. The obtained final image were clear and neat and was helpful in determining problems easily and accurately.

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