



## UNIVERSITY OF GONDAR

### FACULTY OF NATURAL AND COMPUTATIONAL SCIENCE DEPARTMENT OF COMPUTER SCIENCE

#### EXPERIMENTAL RESULT

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**Project Title: Image Filtering**

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**Submitted to: Dr. Million**

This document depicts the Experimental result of the image filtering prepared for Multimedia MSc. Course project.

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## 1. Adding Noise

Original sample picture

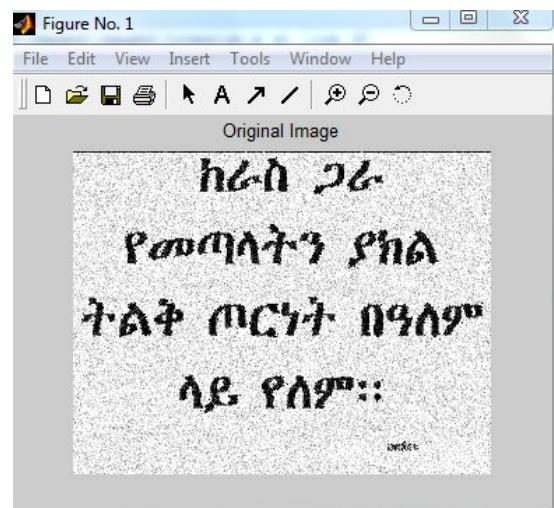


Figure 1: Original Image

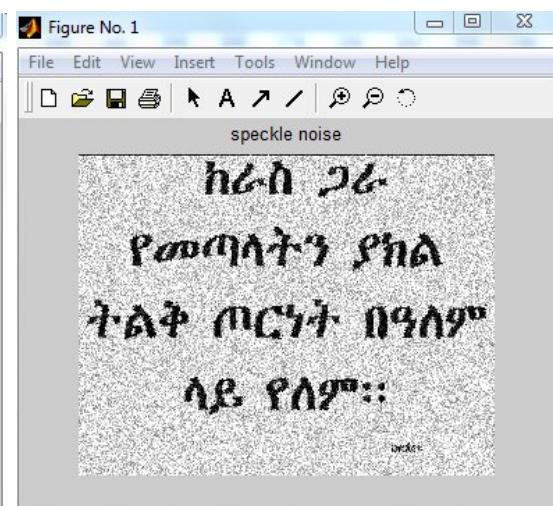
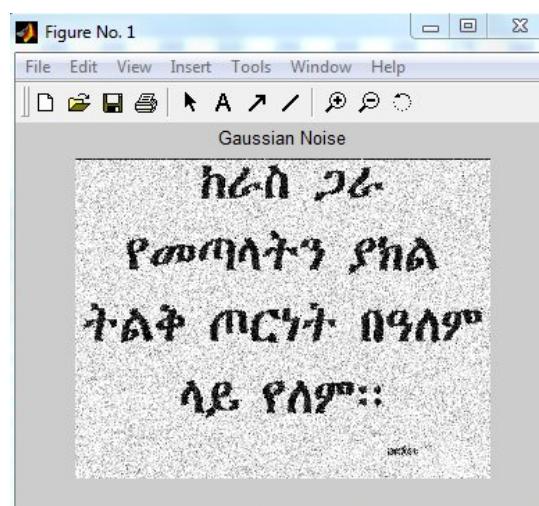
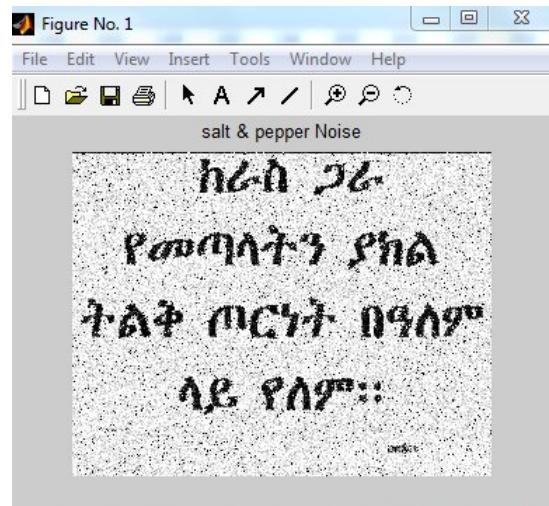


Figure 2: Salt & Pepper Noise, Gaussian Noise and Speckle Noise

## 2. Filtering the image with salt and pepper noise

### Median Filtering

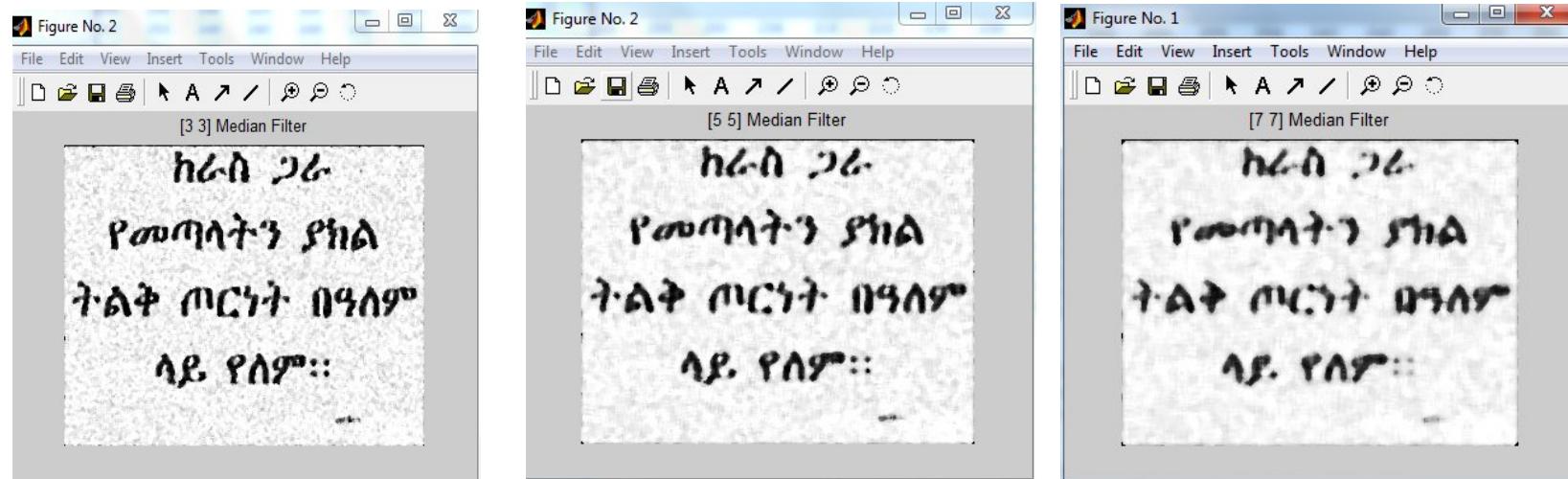


Figure 3: Median Filter effect on Salt & pepper Noise

### Adaptive filtering

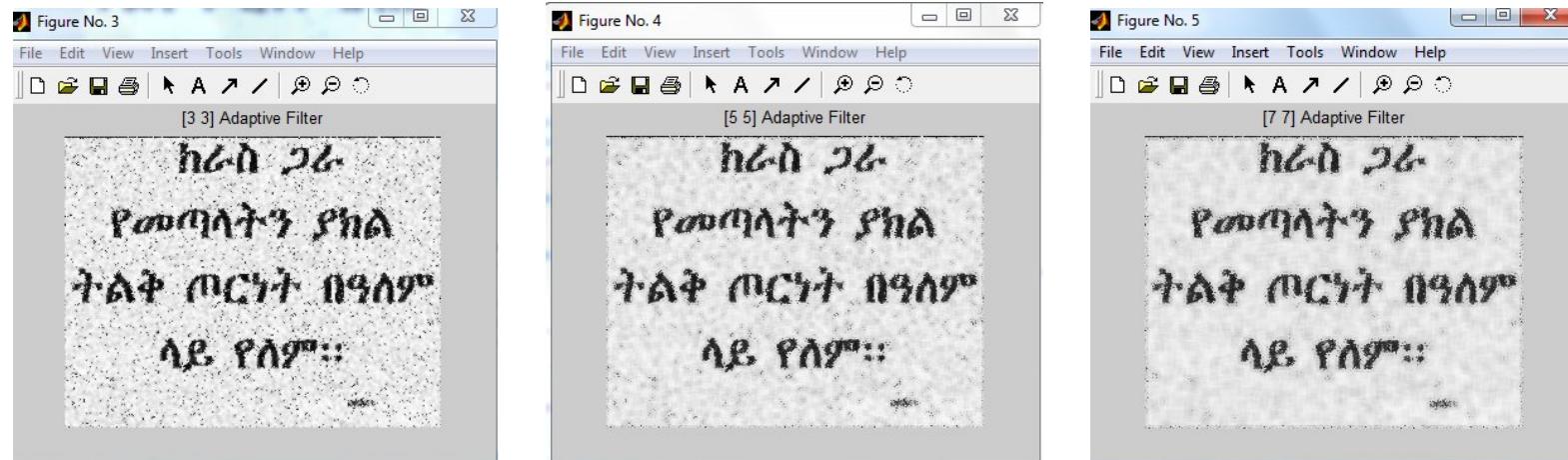


Figure 4: Adaptive filter effect on Salt & pepper Noise

## Average Filtering

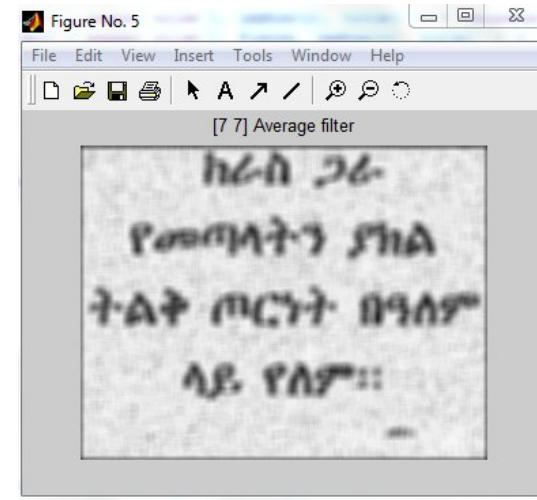
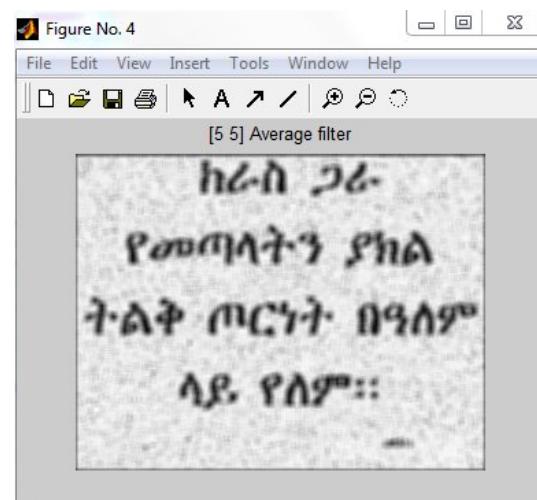
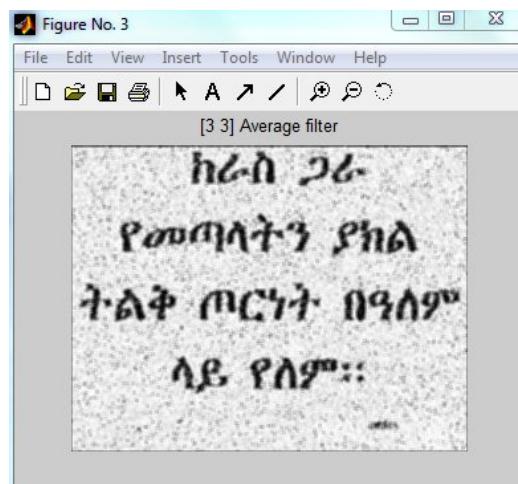


Figure 5: Average filter effect on Salt & pepper Noise

## Gaussian filtering

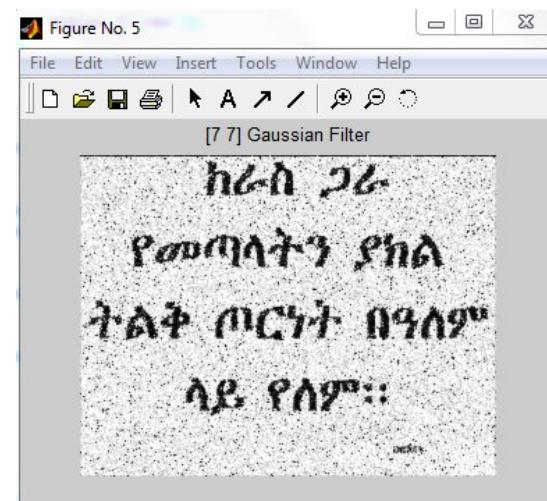
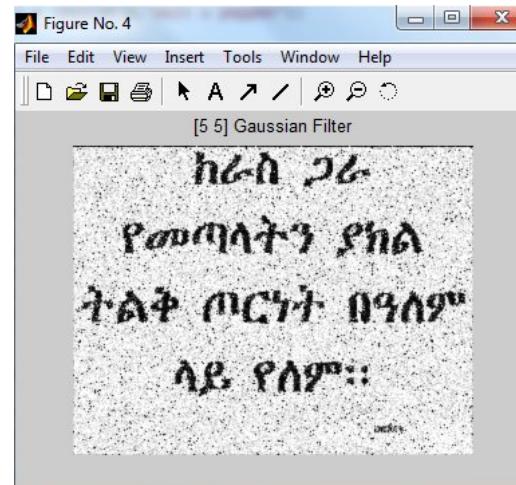
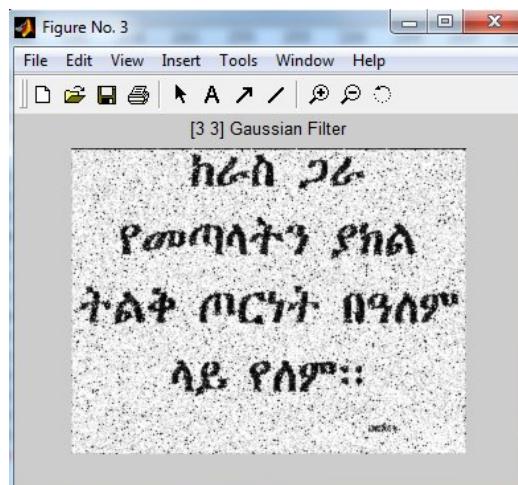


Figure 6: Gaussian filter effect on Salt & pepper Noise

## Average and Gaussian

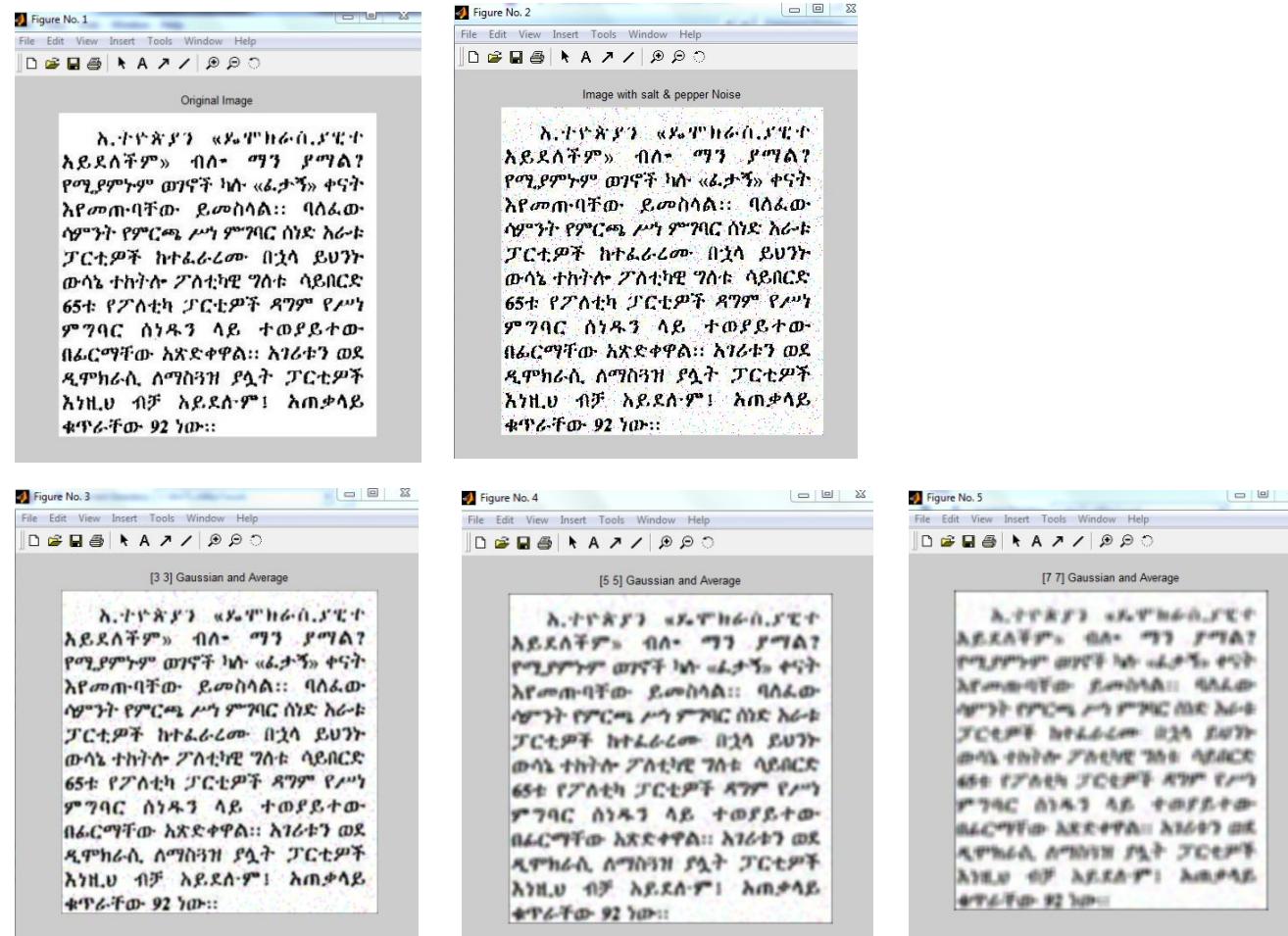


Figure 7: Average and Gaussian filter effect on Salt & pepper Noise

## Average and imadjust

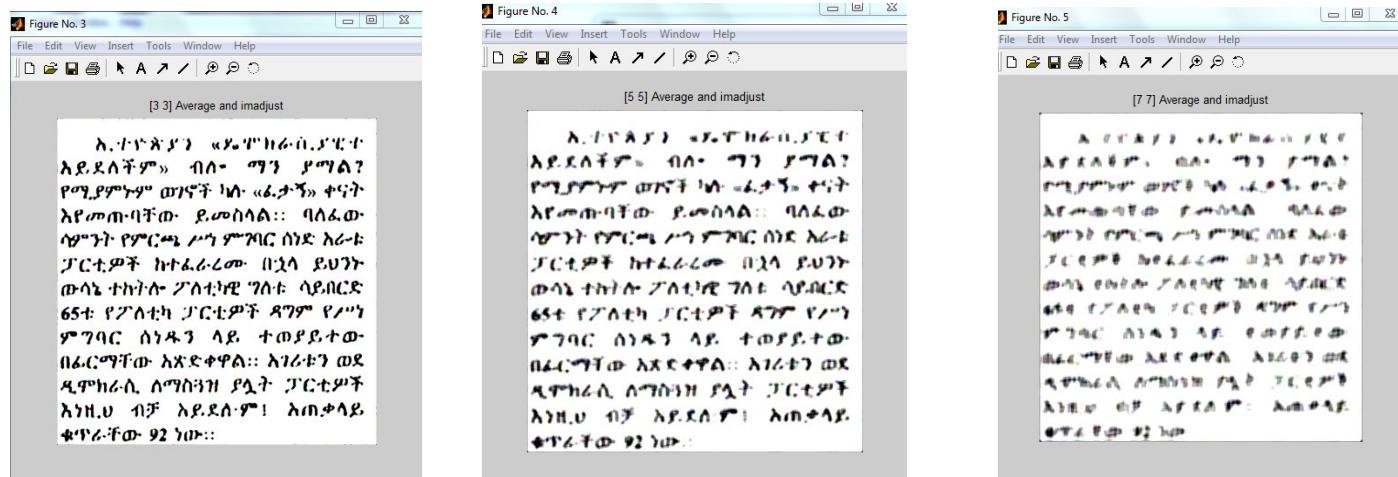


Figure 8: Average and imadjust filter effect on Salt & pepper Noise

## Gaussian and imadjust

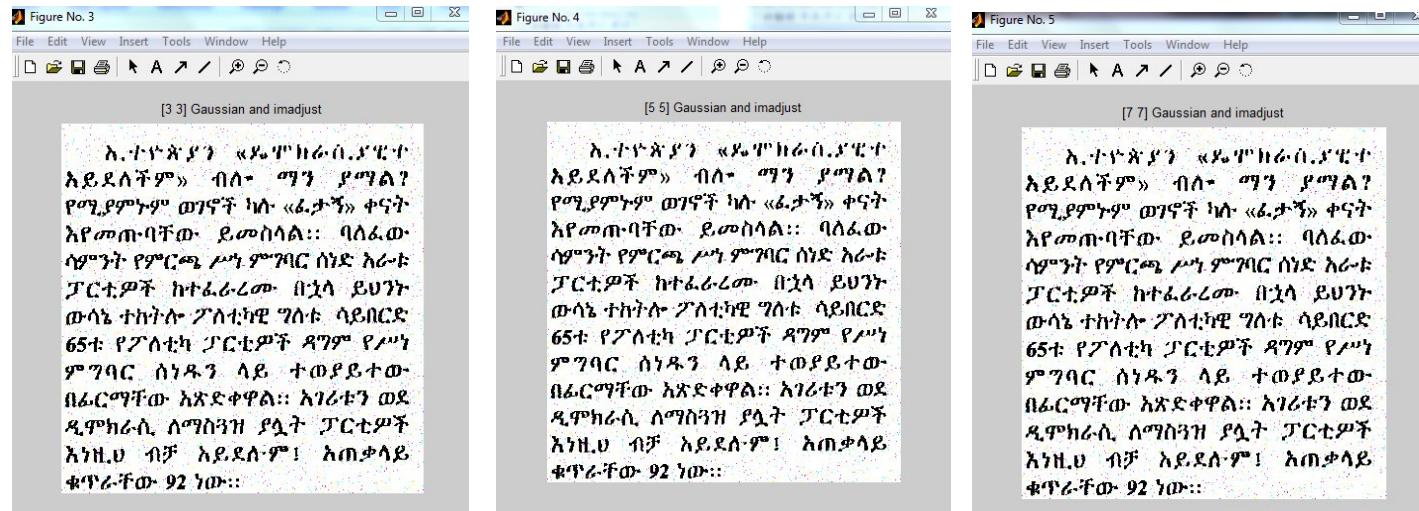


Figure 9: Gaussian and imadjust filter effect on Salt & pepper Noise

### 3. Filtering the image with Speckle Noise

#### Average Filtering

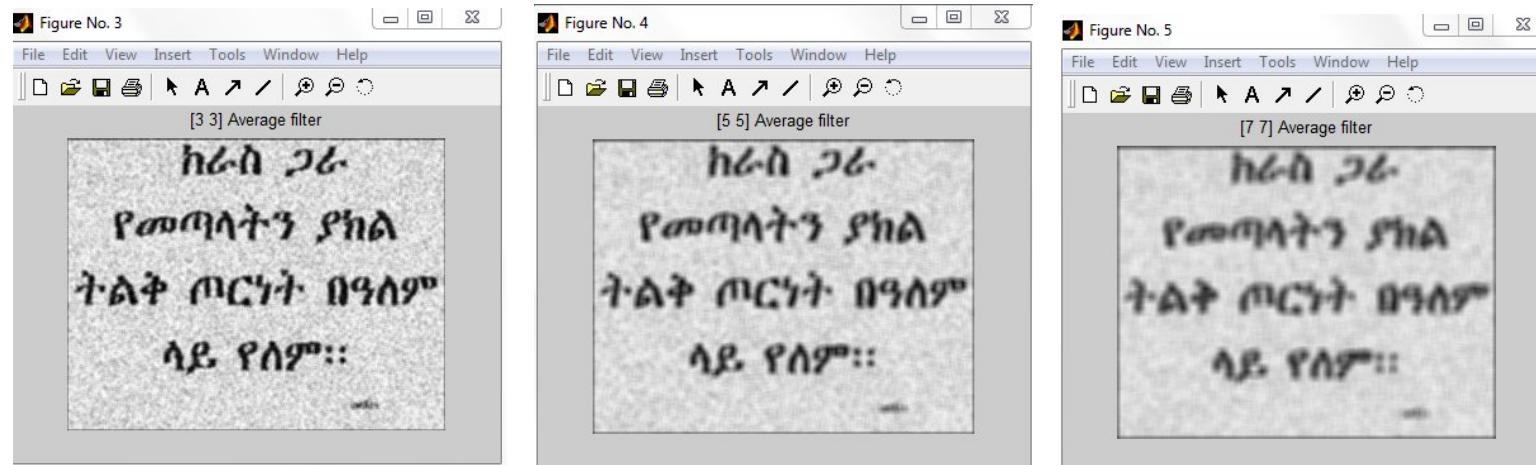


Figure 10: Average filter effect on speckle Noise

#### Gaussian Filtering

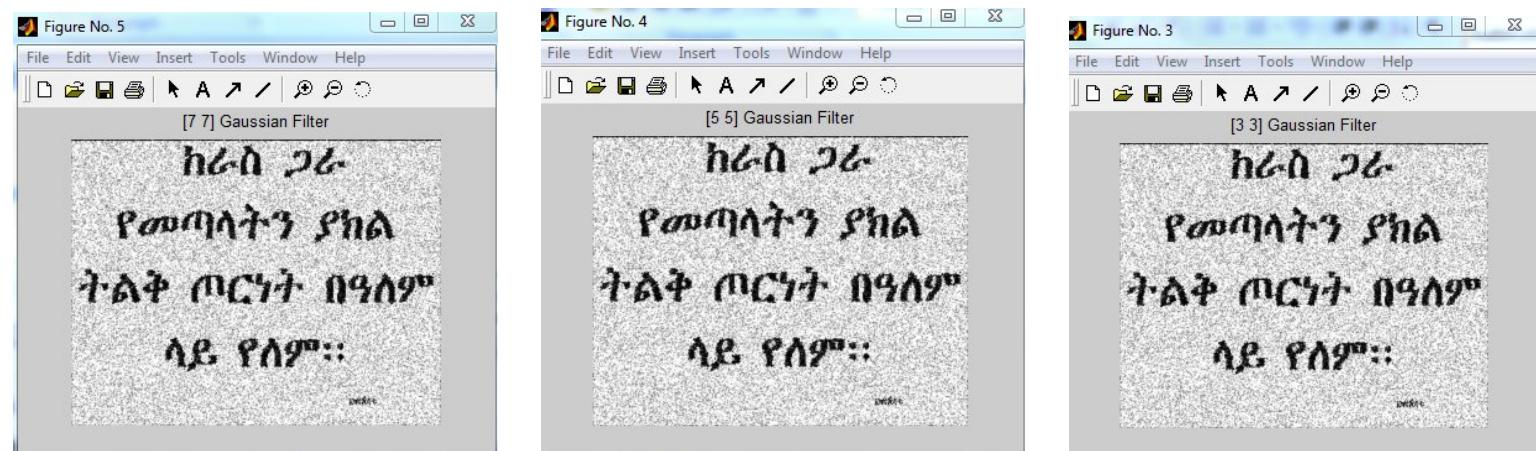


Figure 11: Gaussian filter effect on speckle Noise

## Median Filtering

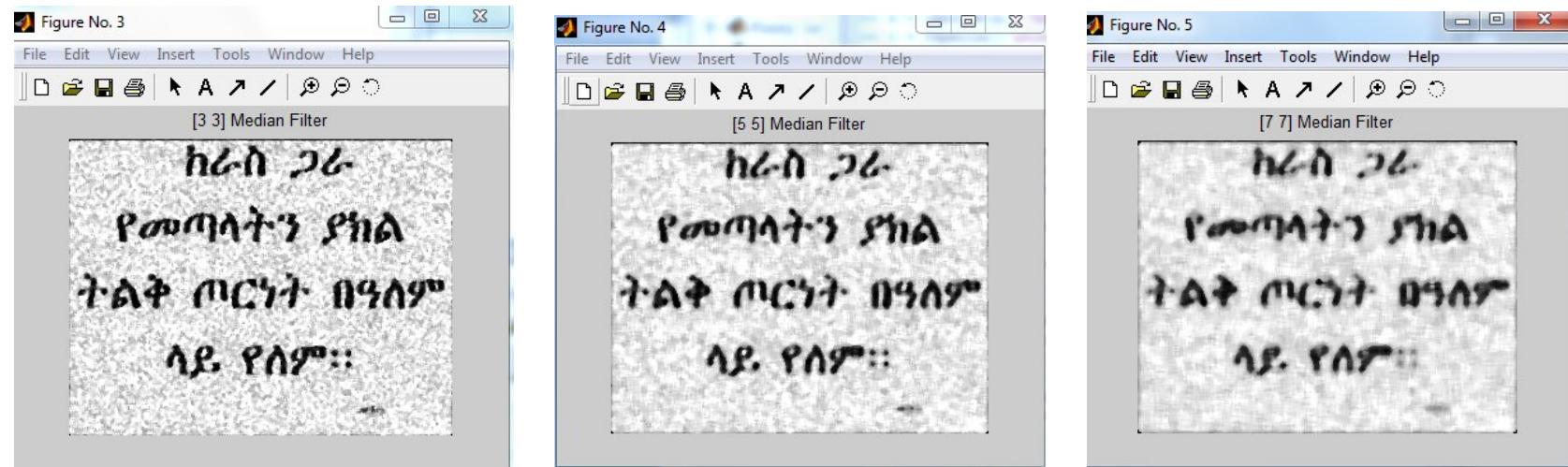


Figure 12: Median filter effect on speckle Noise

## Adaptive Filtering

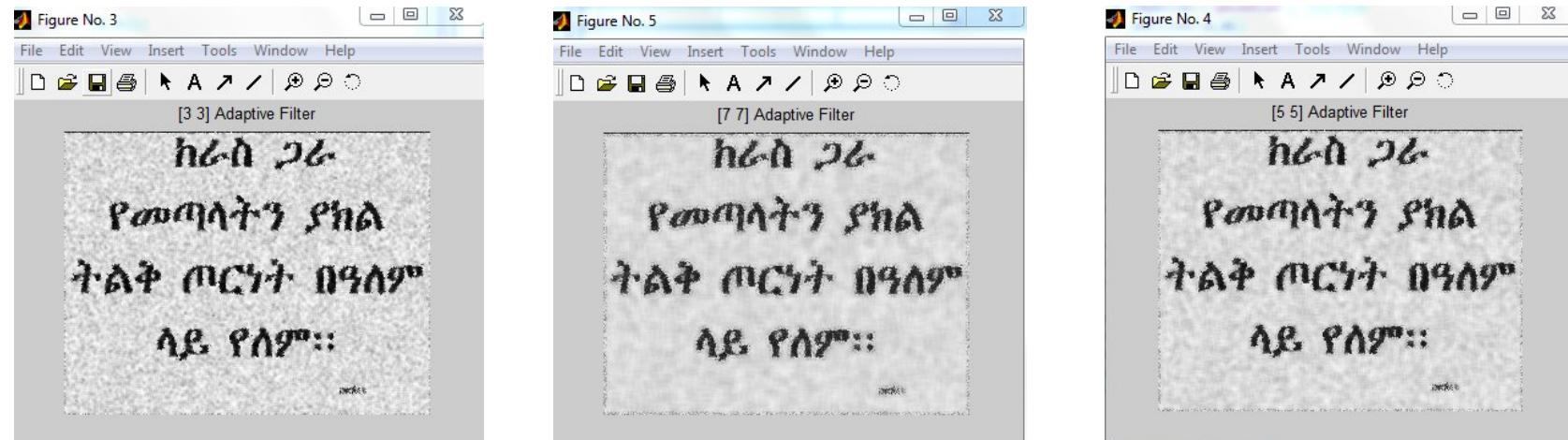


Figure 13: Adaptive filter effect on speckle Noise

## Average and Gaussian



**Figure 14: Average and Gaussian filter effect on Speckle Noise**

## Average and imadjust

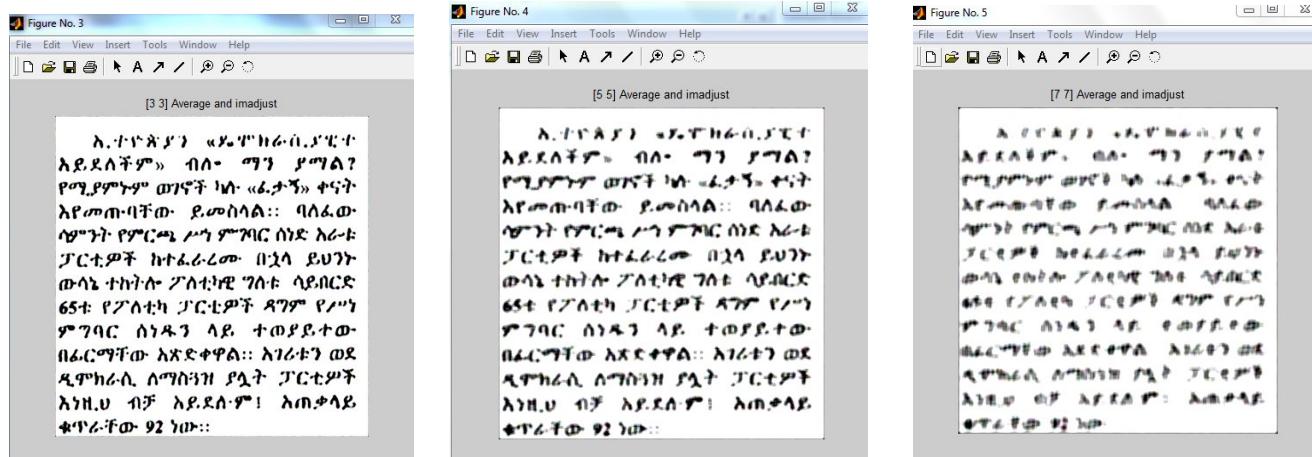


Figure 15: Average and imadjust filter effect on Speckle Noise

## Gaussian and imadjust

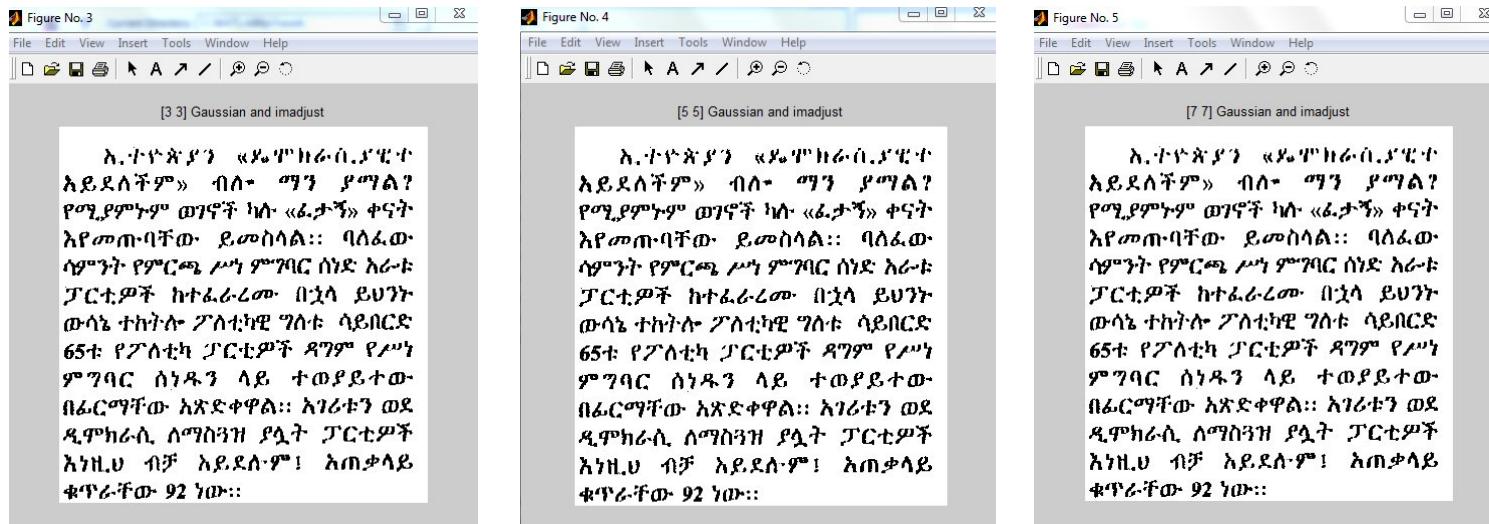


Figure 16: Gaussian and imadjust filter effect on Speckle Noise

## 4. Filtering the Image with Gaussian Noise

### Adaptive Filtering

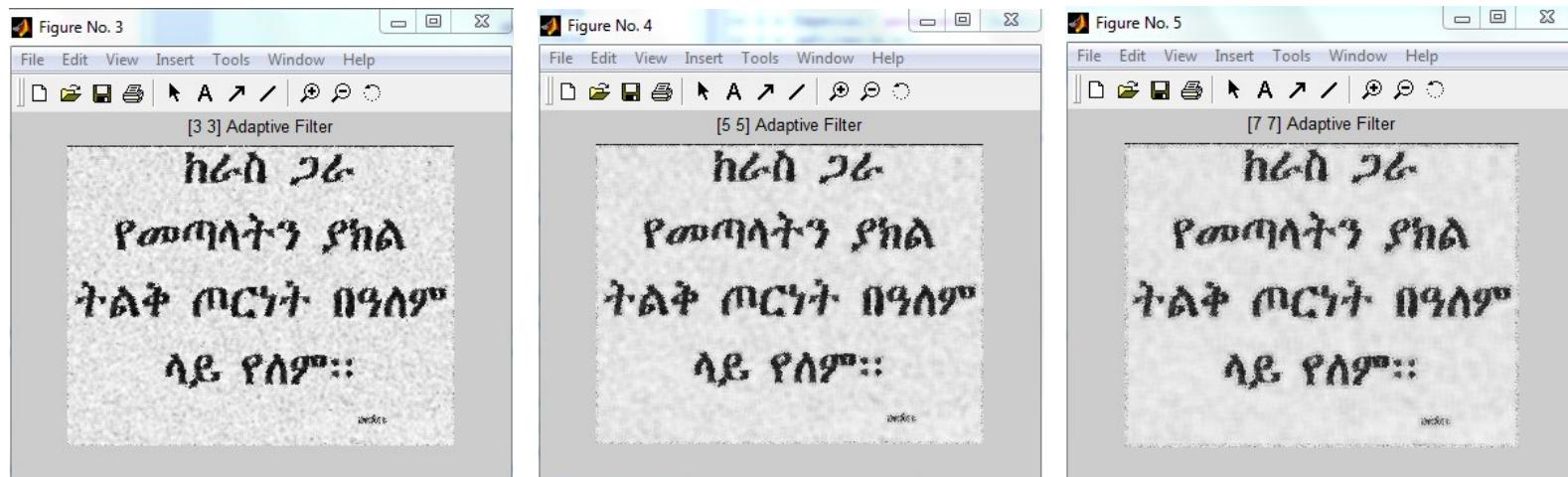


Figure 17: Adaptive filter effect on Gaussian Noise

### Median Filtering

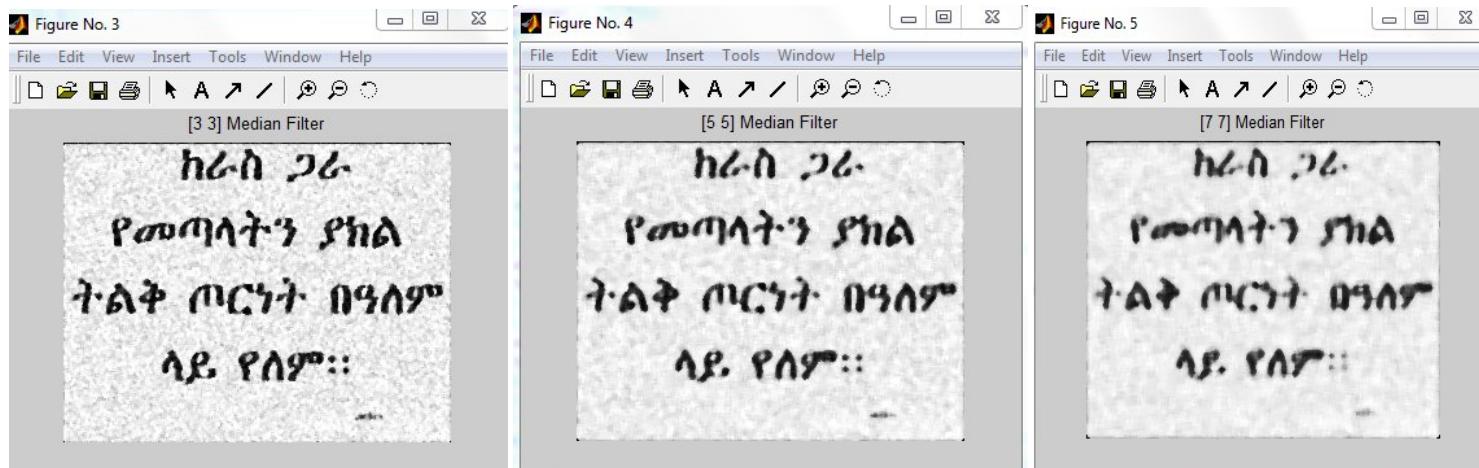


Figure 18: Median filter effect on Gaussian Noise

## Gaussian Filtering

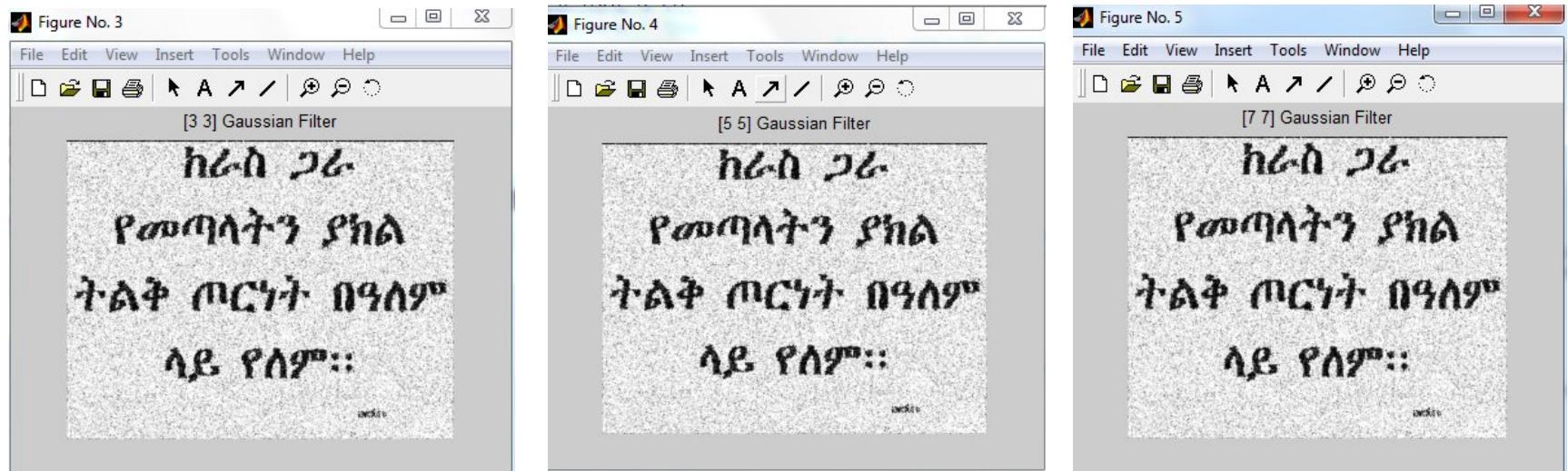


Figure 19: Gaussian filter effect on Gaussian Noise

## Average Filtering

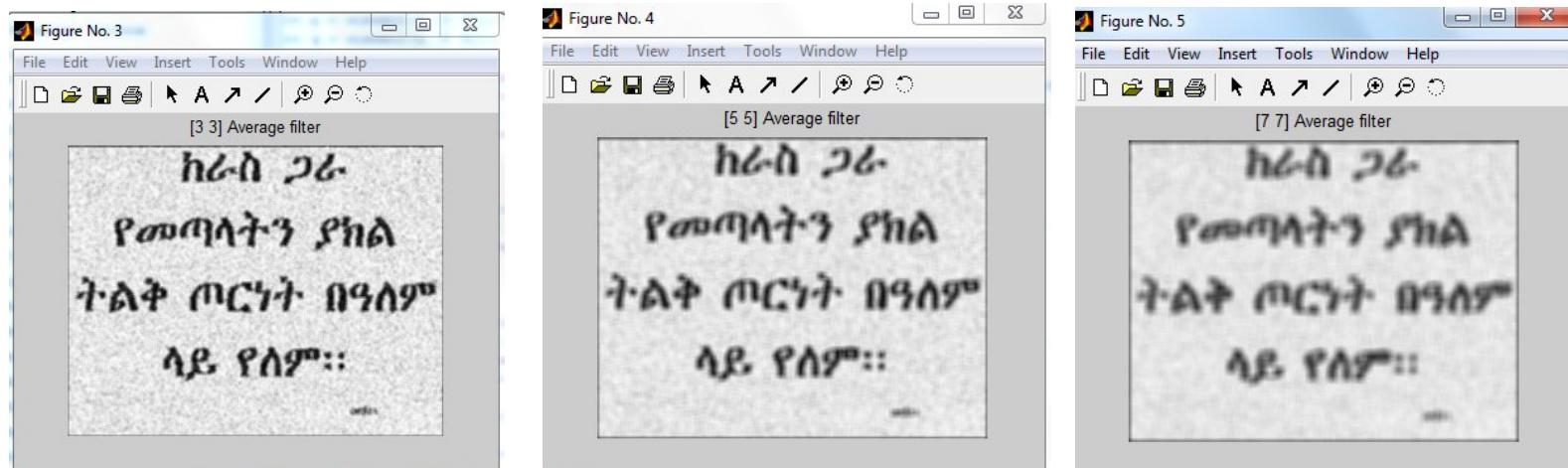
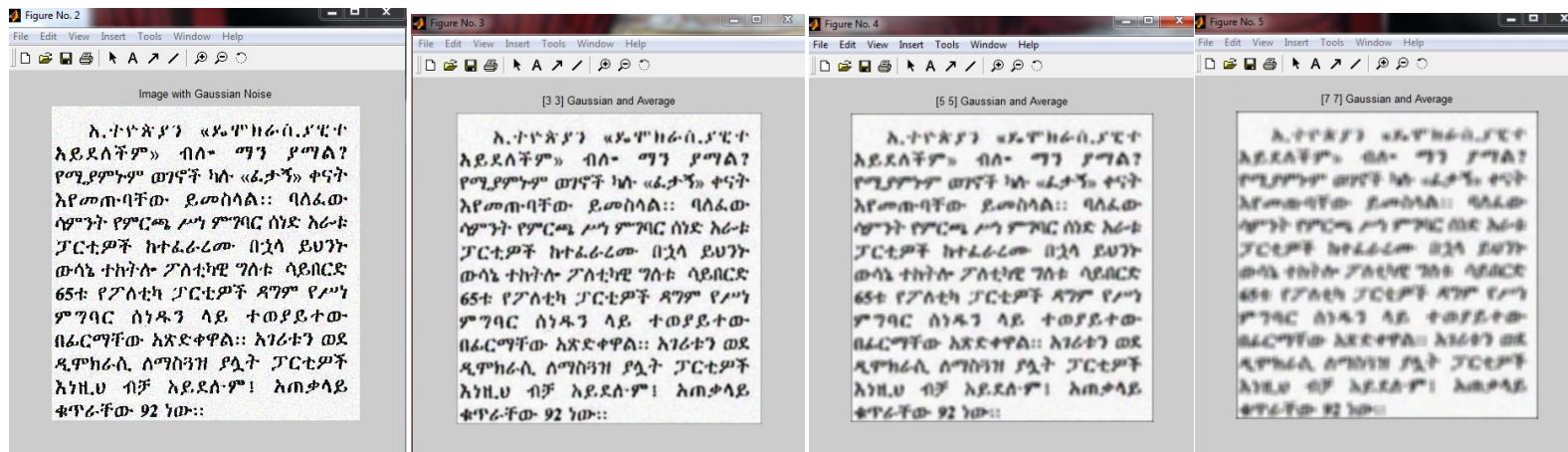


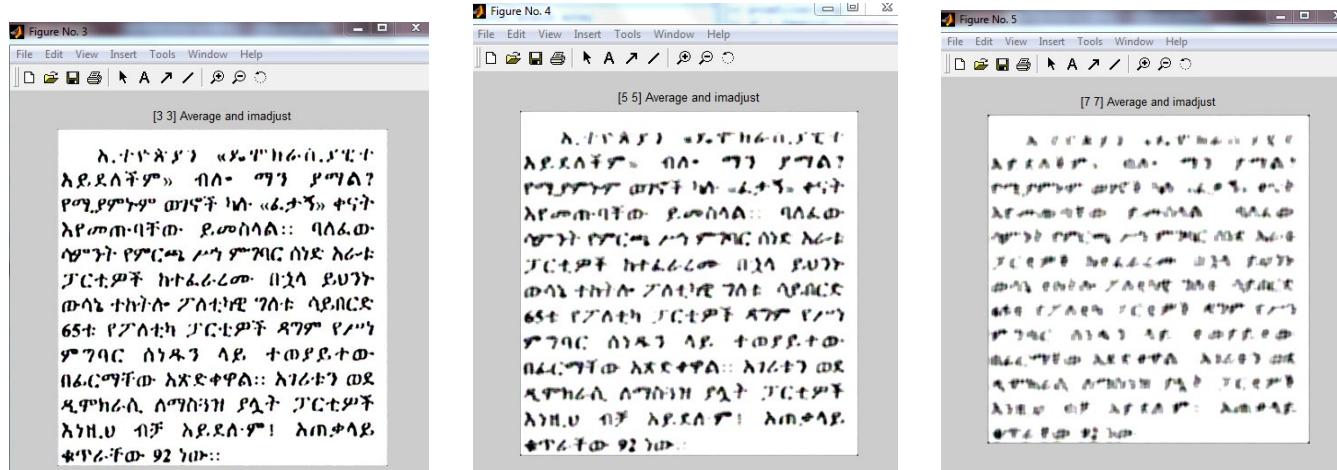
Figure 20: Average filter effect on Gaussian Noise

Average and Gaussian



**Figure 21: Average and Gaussian filter effect on Gaussian Noise**

Average and imadjust



**Figure 22: Average and imadjust filter effect on Gaussian Noise**

## Gaussian and imadjust

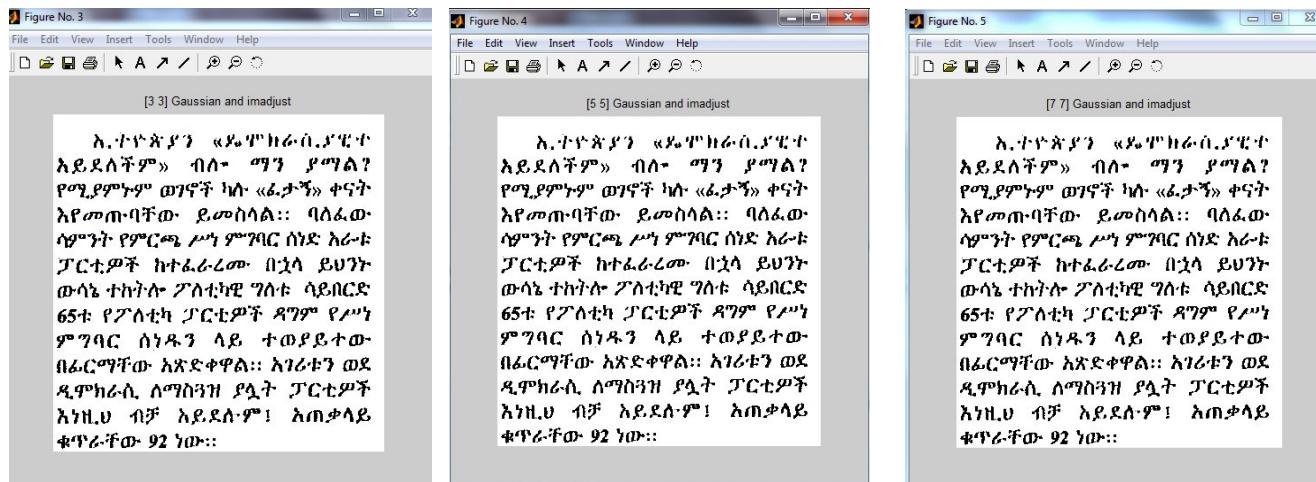


Figure 23: Gaussian and imadjust filter effect on Gaussian

## 5. Filtering Original Image

### Original Image



Figure 24: Original Image

## Average filtering

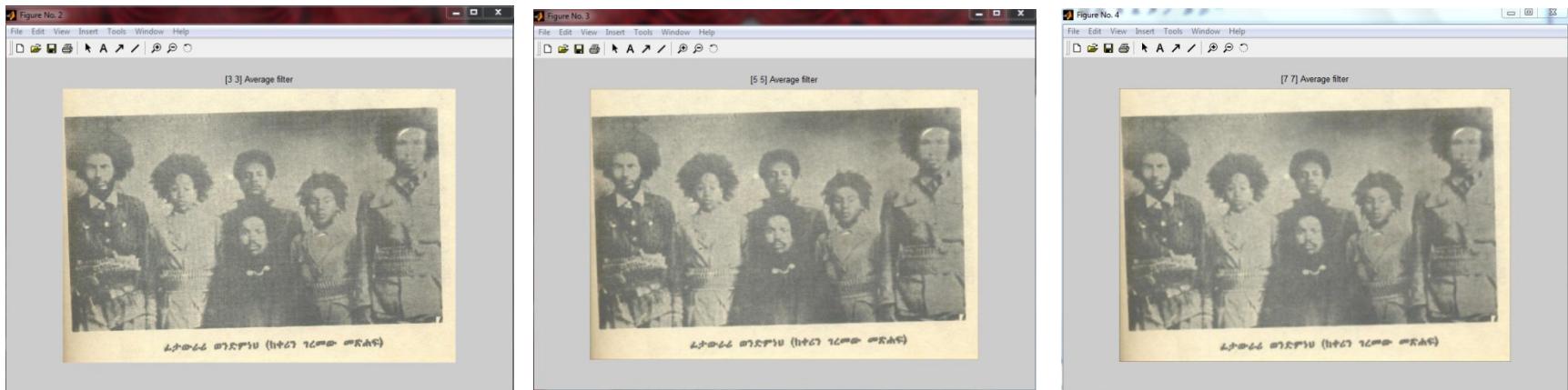


Figure 25: Average filter effect on the Original Image

## Gaussian filtering



Figure 26: Gaussian filter effect on the Original Image

## BWAREAOPEN filtering

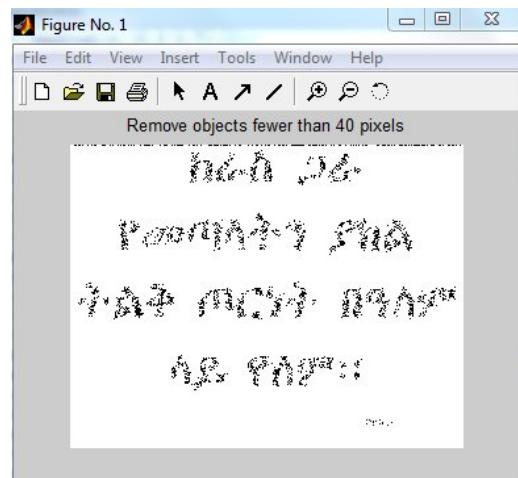


Figure 27: Binary area Open

## Minimum filtering

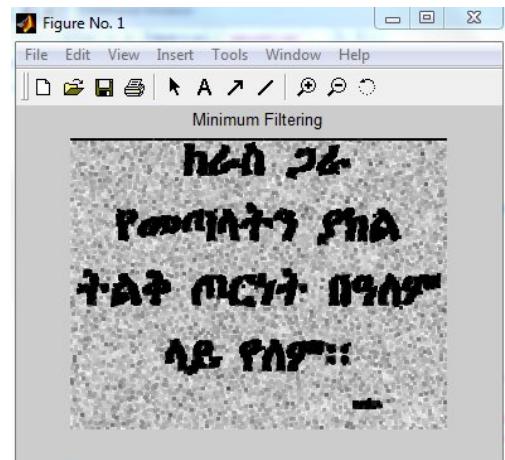


Figure 28: Minimum Filtering

## Maximum Filtering

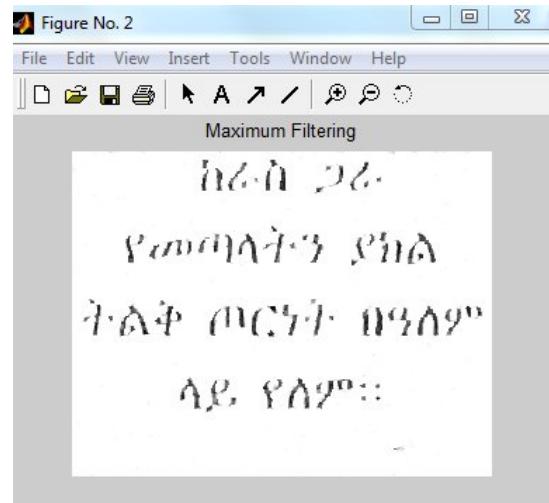


Figure 29: Maximum Filtering

## Adjust image intensity value or color map

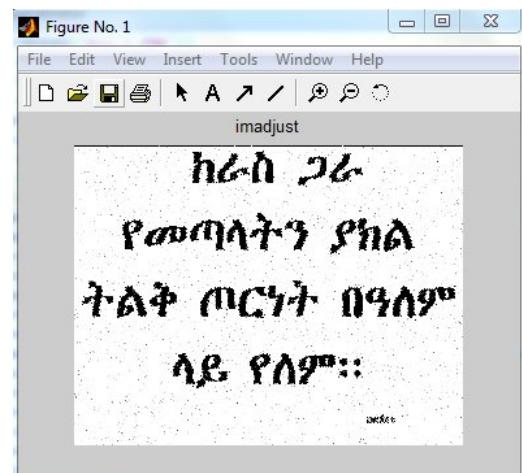


Figure 30: Image adjust

## Edge Detection

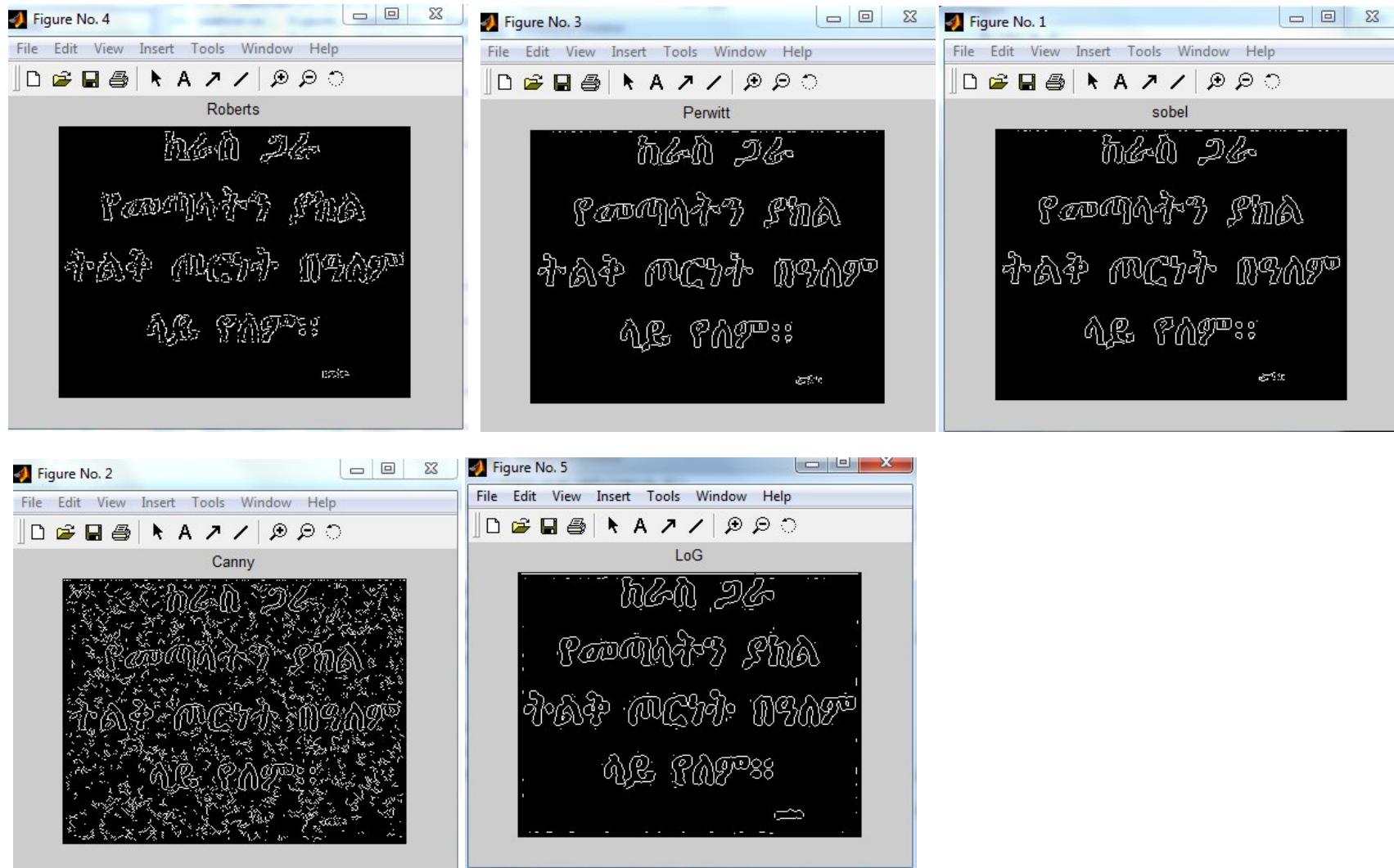


Figure 31: Edge detection

## Gaussian and Average

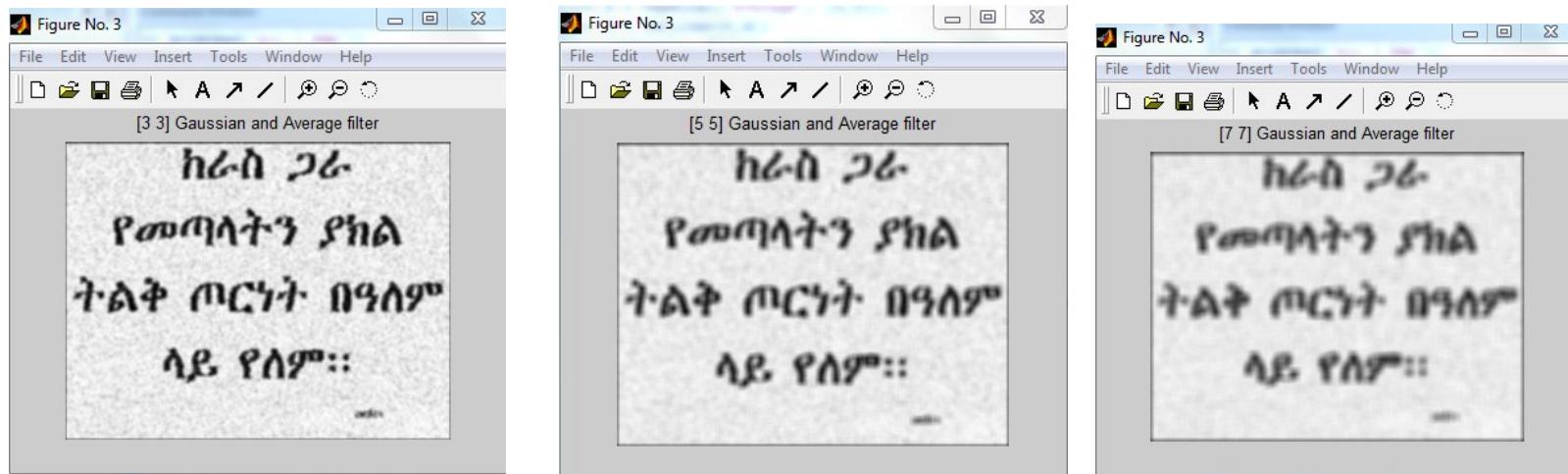


Figure 32: Gaussian and Average Filter

## Average and Median

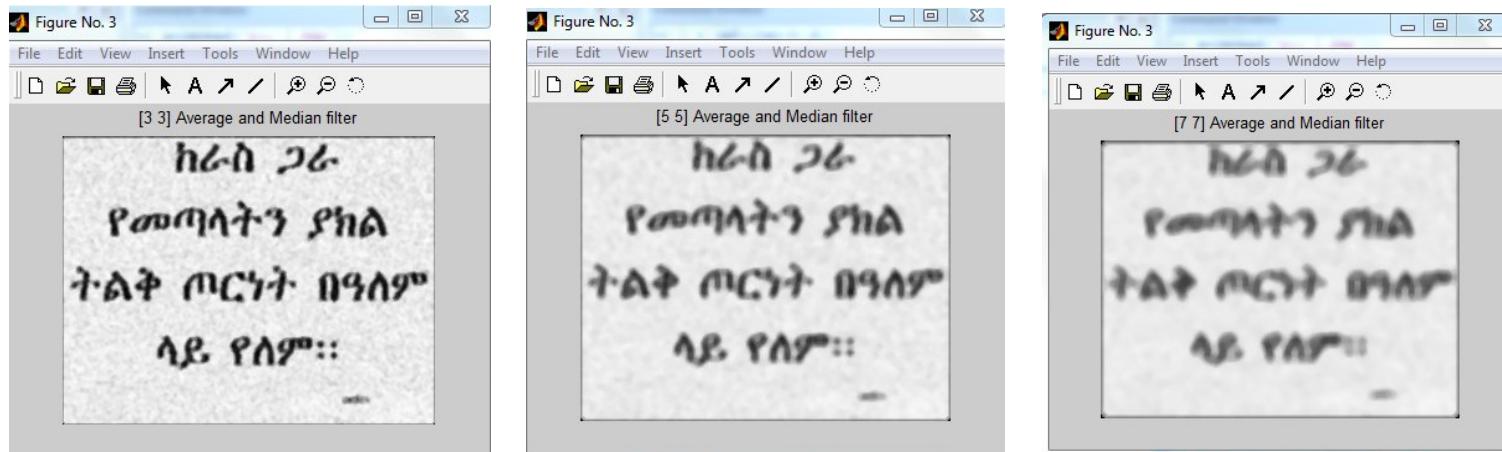


Figure 33: Average and Median filter

## Gaussian and Median

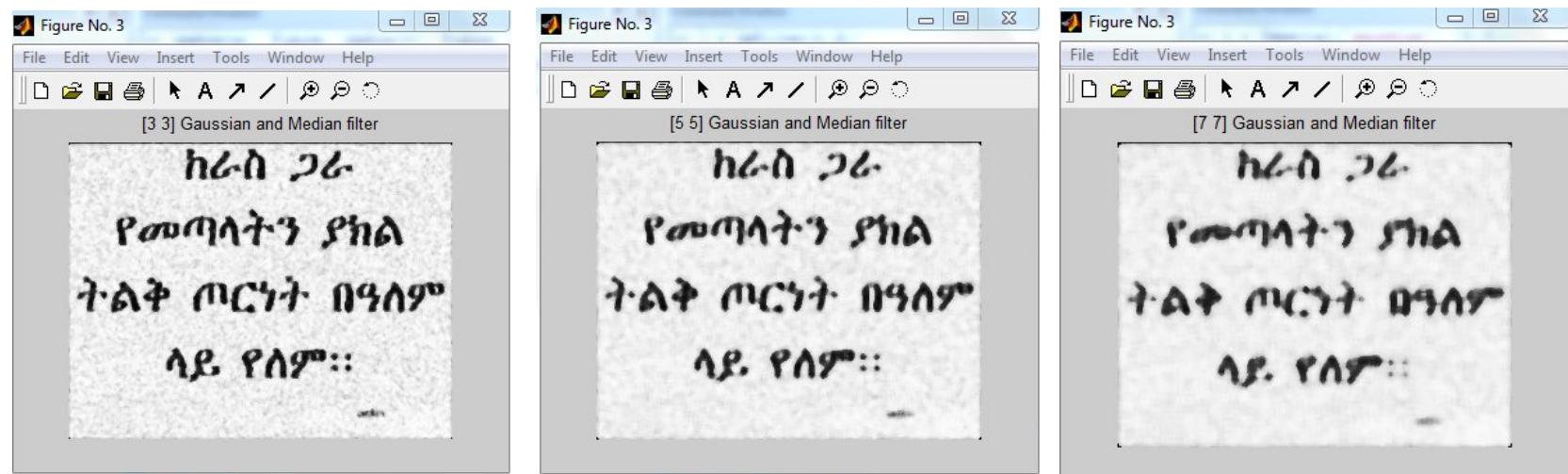


Figure 34: Gaussian and Median filter

## Average and Adaptive

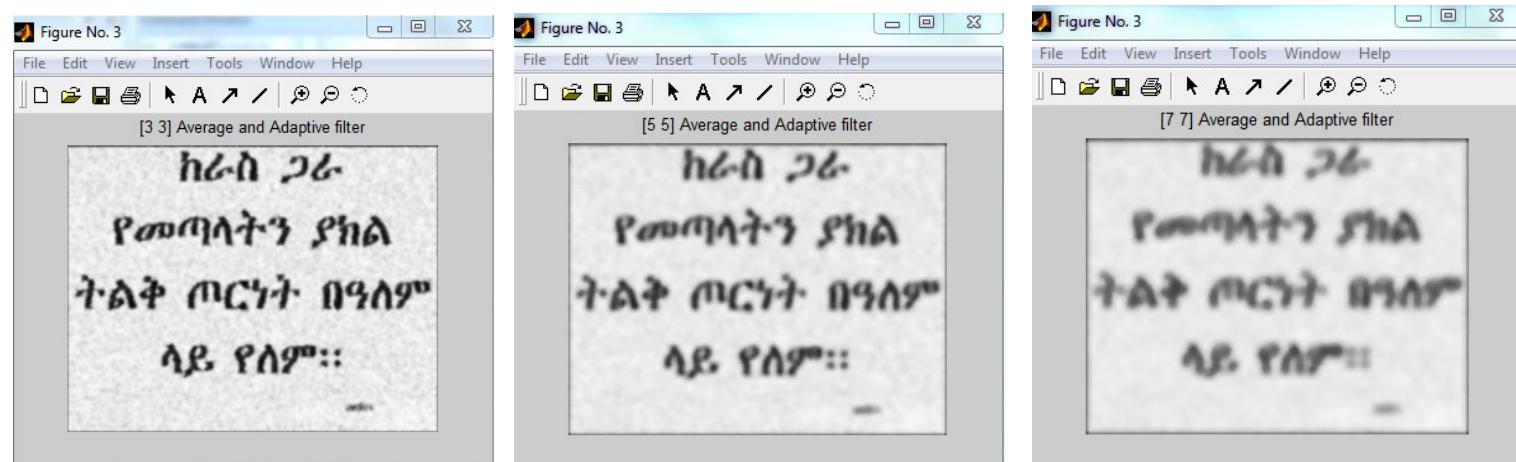


Figure 35: Average and Adaptive filter

## Gaussian and Adaptive

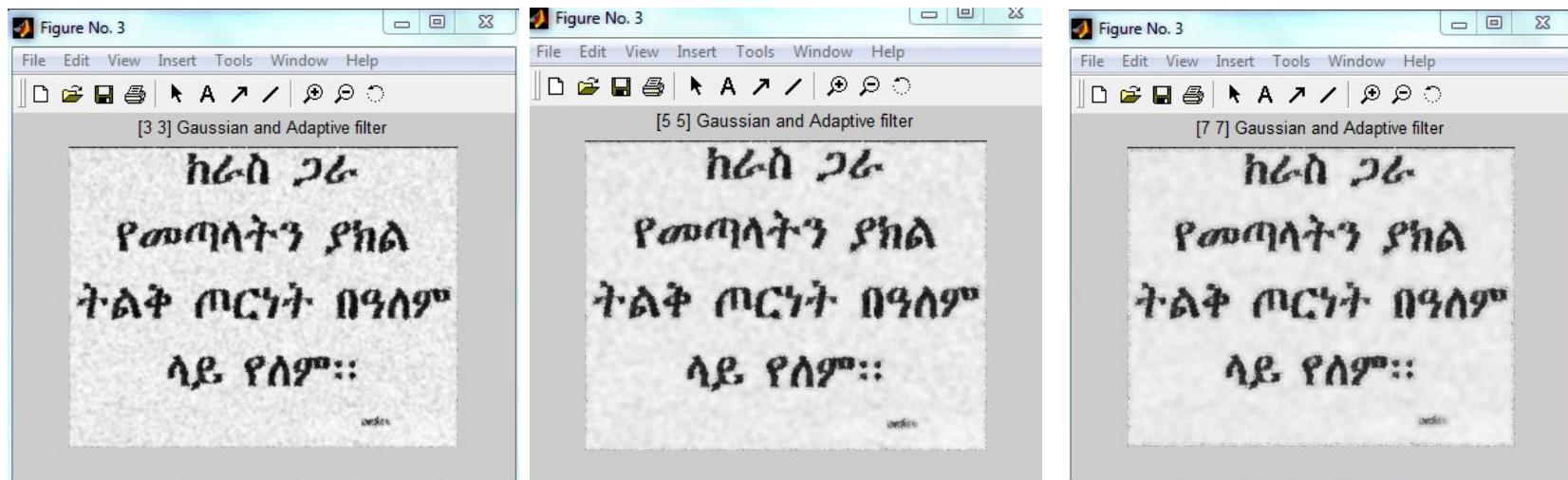


Figure 36: Gaussian and Adaptive filter

## Adaptive and Median

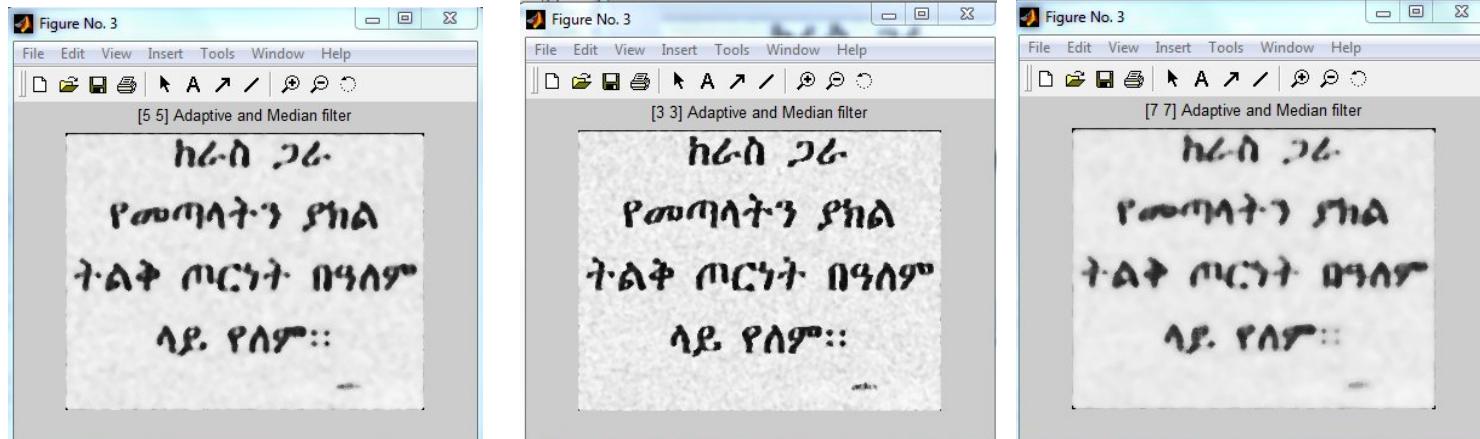


Figure 37: Adaptive and Median filter

## Gaussian and imadjust

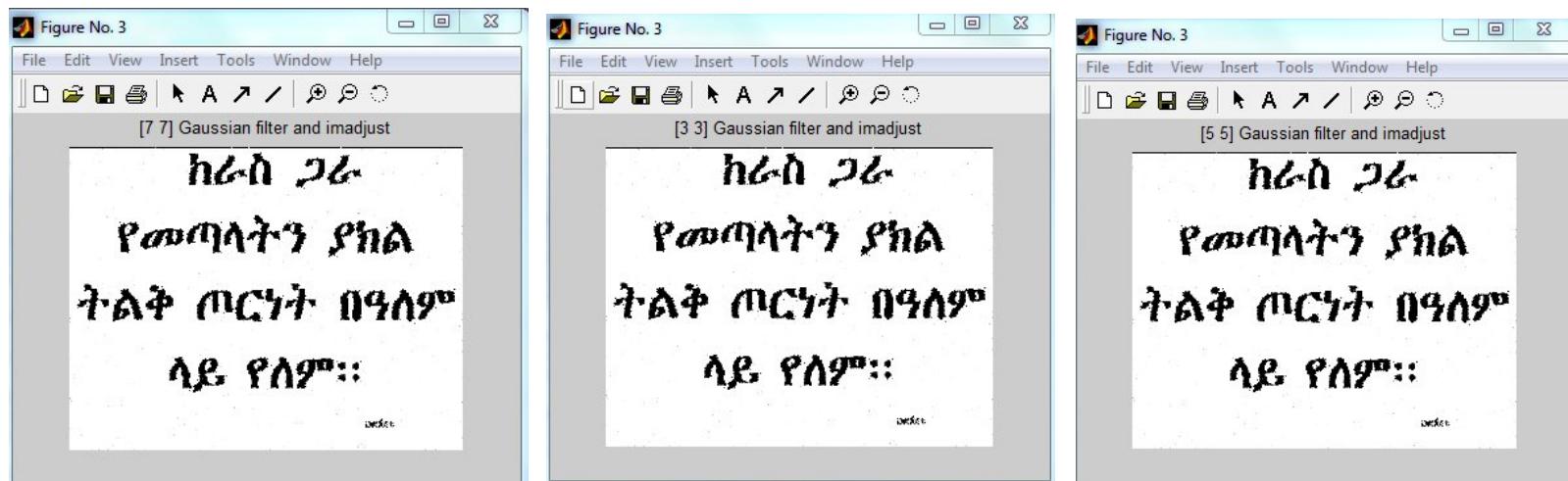


Figure 38: Gaussian and imadjust filter

## Average and imadjust

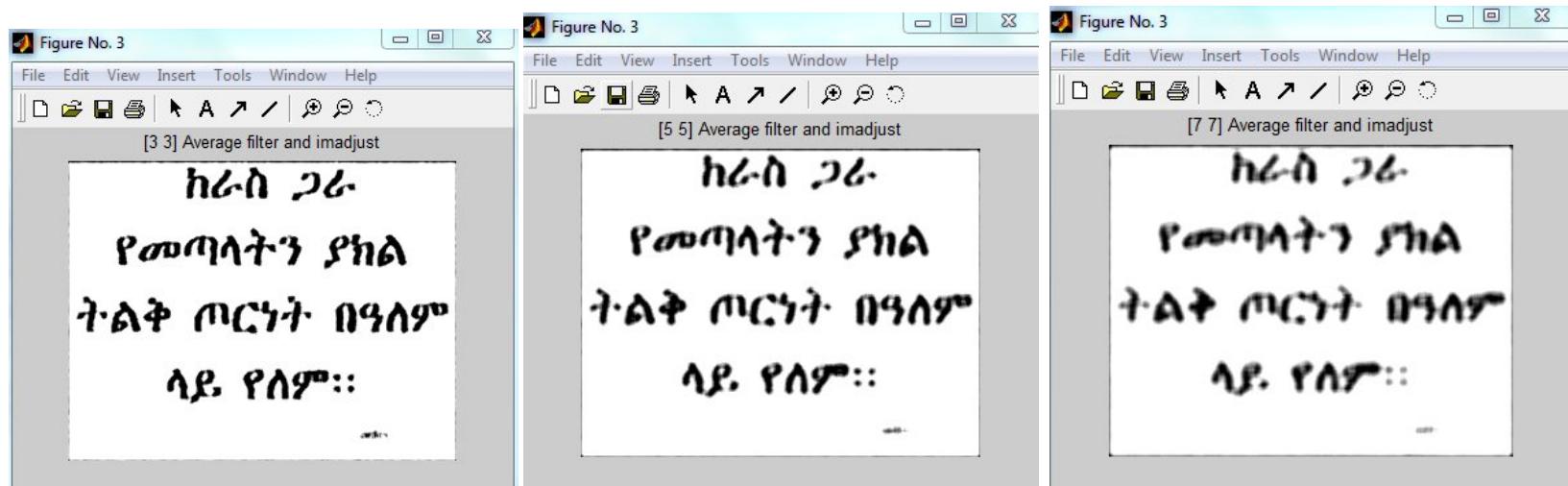


Figure 39: Average and imadjust filter

## Adaptive and imadjust

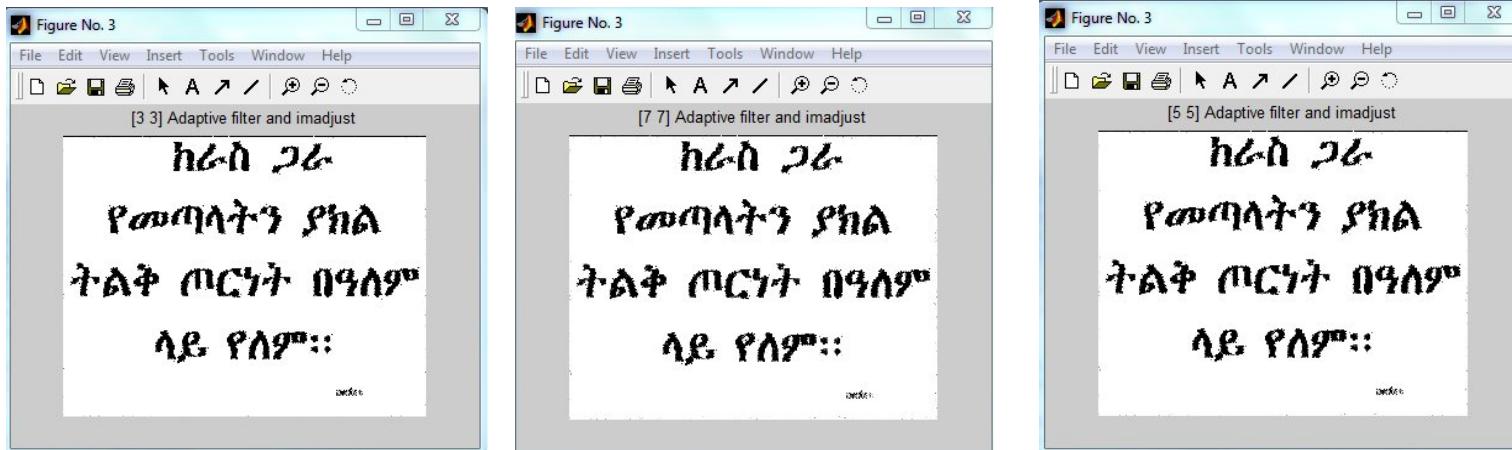


Figure 40: Adaptive and imadjust filter

## Median and imadjust

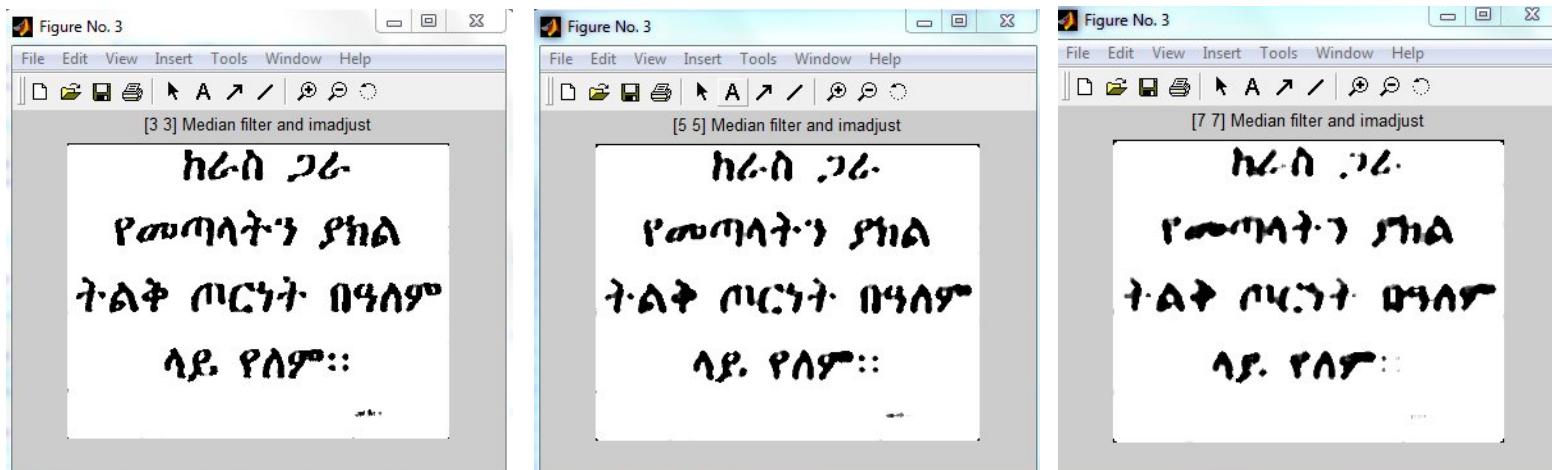


Figure 41: Median and imadjust filter

## Soble Edge detection and Adaptive filter

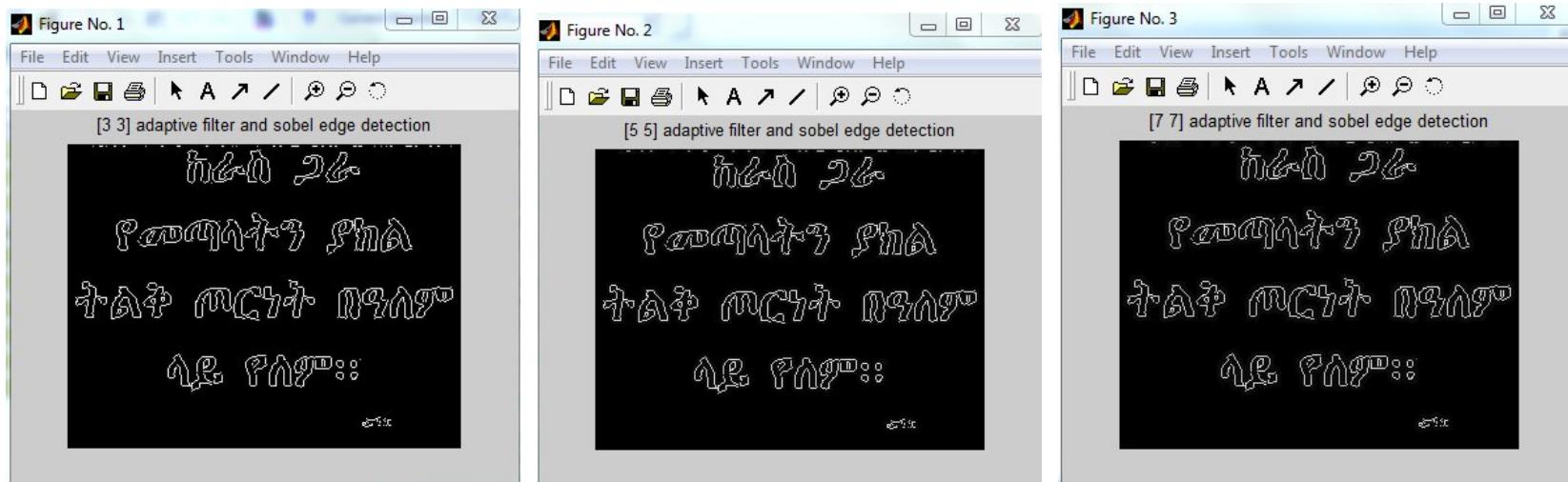


Figure 42: Soble Edge detection and Adaptive filter

## Canny Edge detection and Adaptive filter

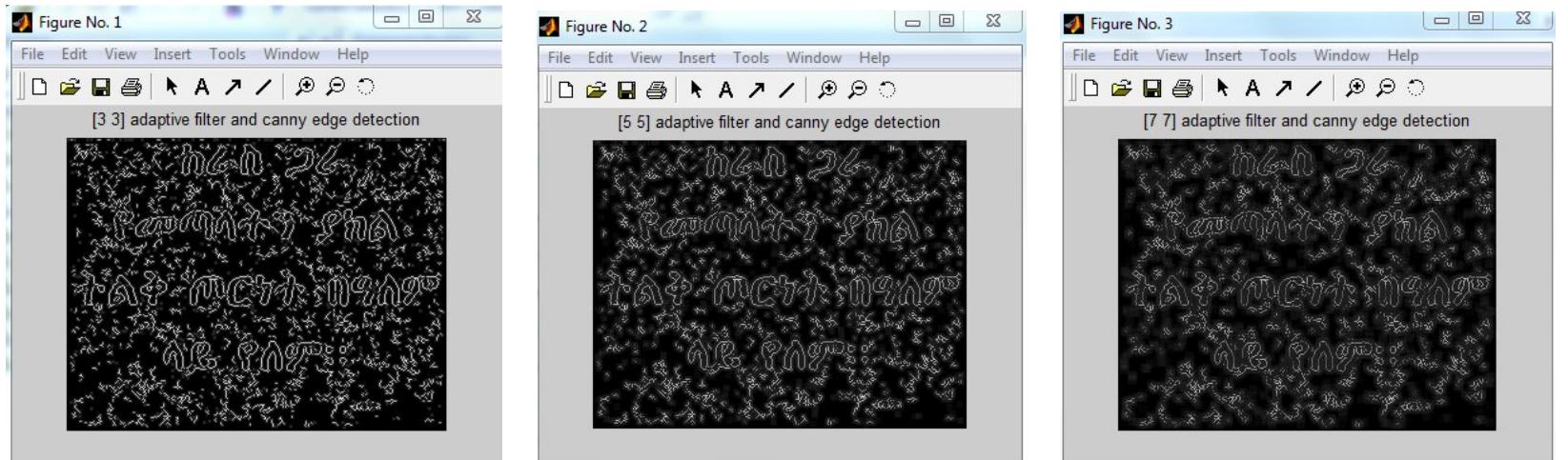


Figure 43: Canny Edge detection and Adaptive filter

## LoG Edge detection and Adaptive filter

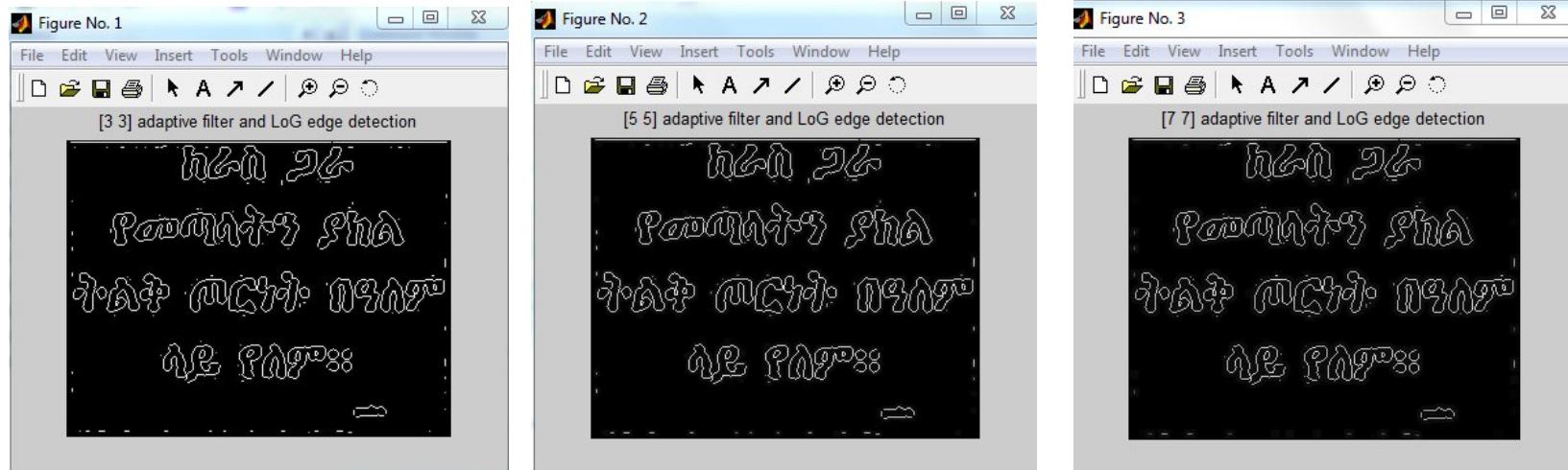


Figure 44: LoG Edge detection and Adaptive filter

## 6. Filtering the image after converting it in to gray

Original Image

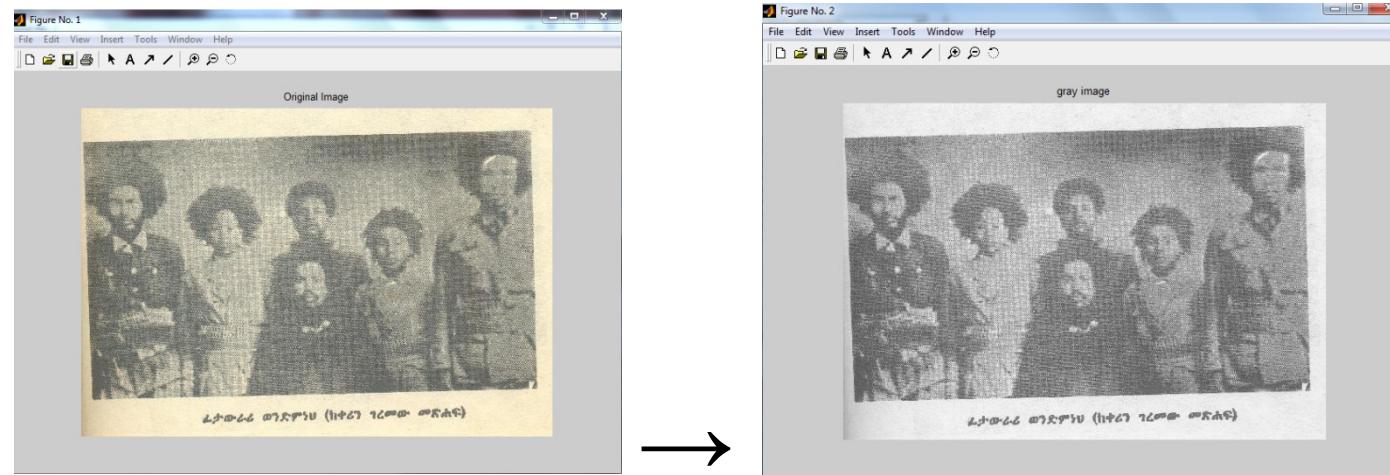


Figure 45: Original Image

## Average Filtering



Figure 46: Average Filter

## Gaussian Filtering



**Figure 47: Gaussian filter**

## Median filtering



**Figure 48: Median Filter**

## Adaptive filtering



Figure 49: Adaptive filter

## Minimum Filtering



Figure 50: Minimum Filtering

## Maximum Filtering



Figure 51: Maximum Filtering

## Original Image

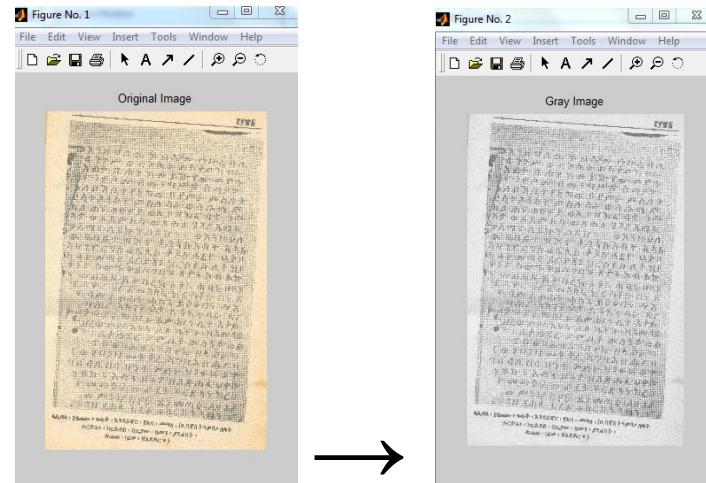


Figure 52: Original Image

## Average and Gaussian filter

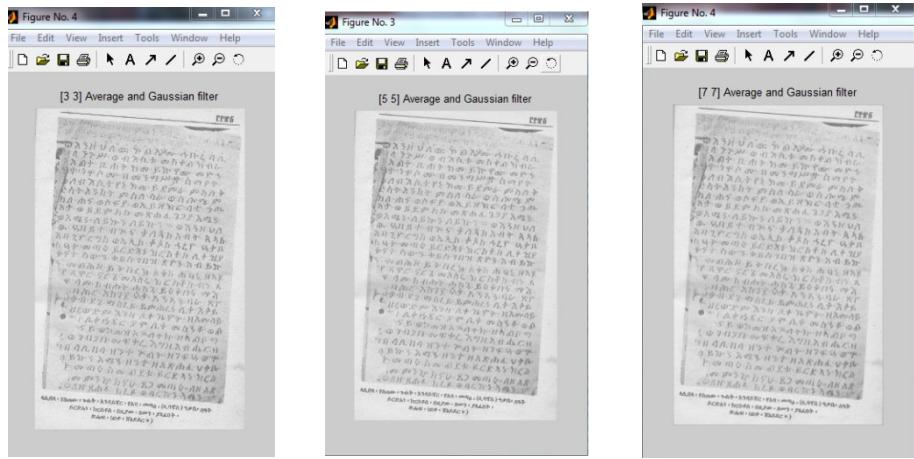


Figure 53: Average and Gaussian filter

## Original Image

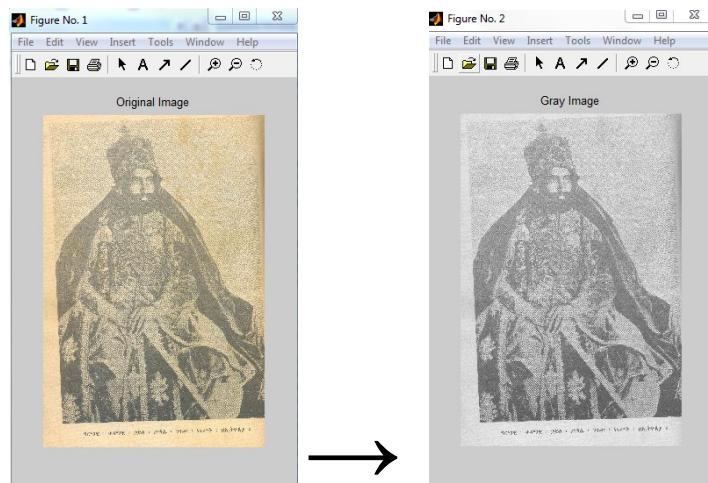


Figure 54: Original Image

## Average and Median

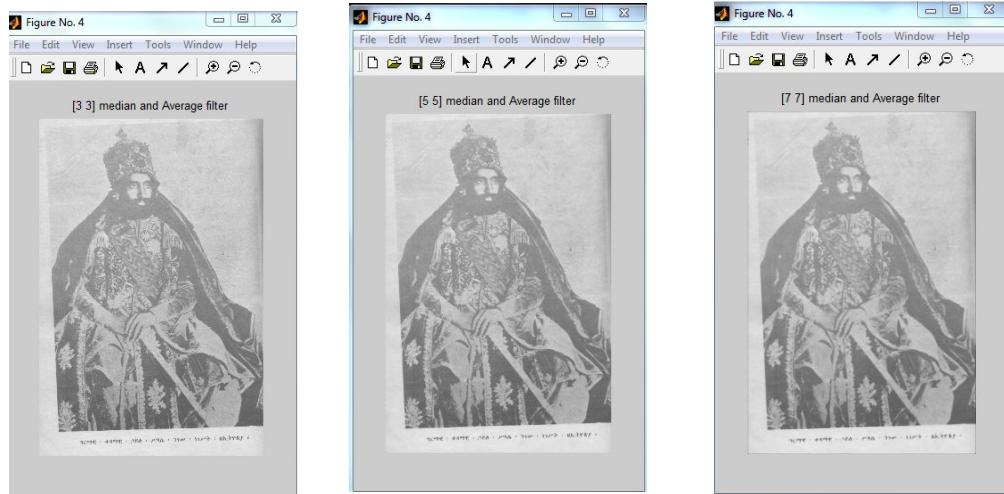


Figure 55: Average and Gaussian

## Original Image

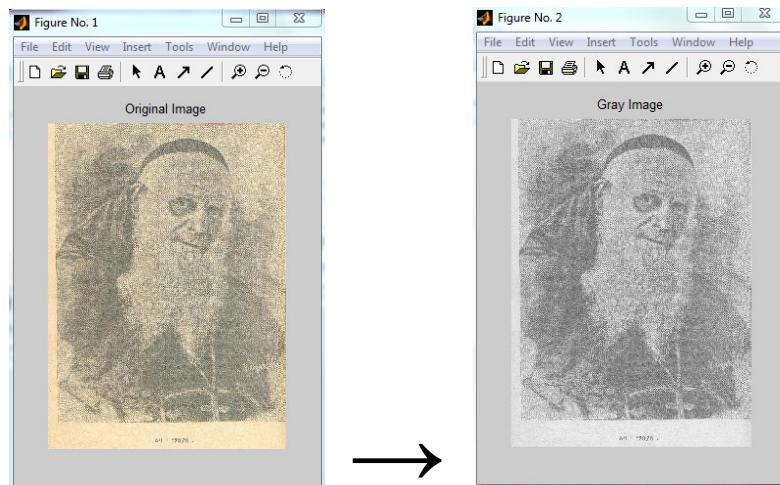


Figure 56: Original Image

## Average and Adaptive

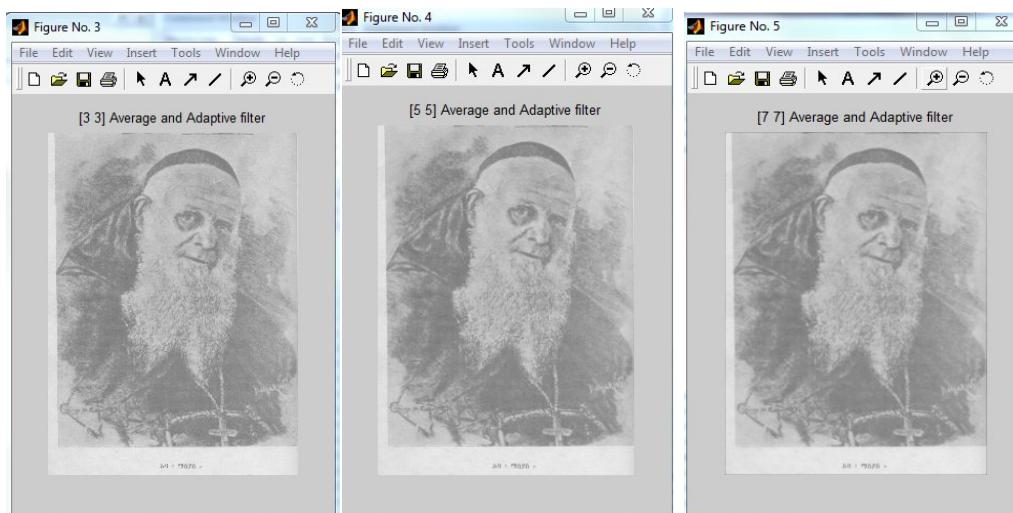


Figure 57: Average and Adaptive filter

## Original Image

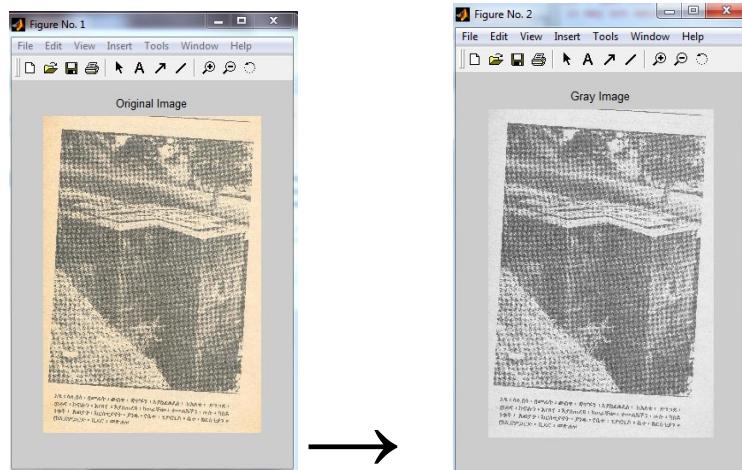


Figure 58: Original Image

## Gaussian and Median

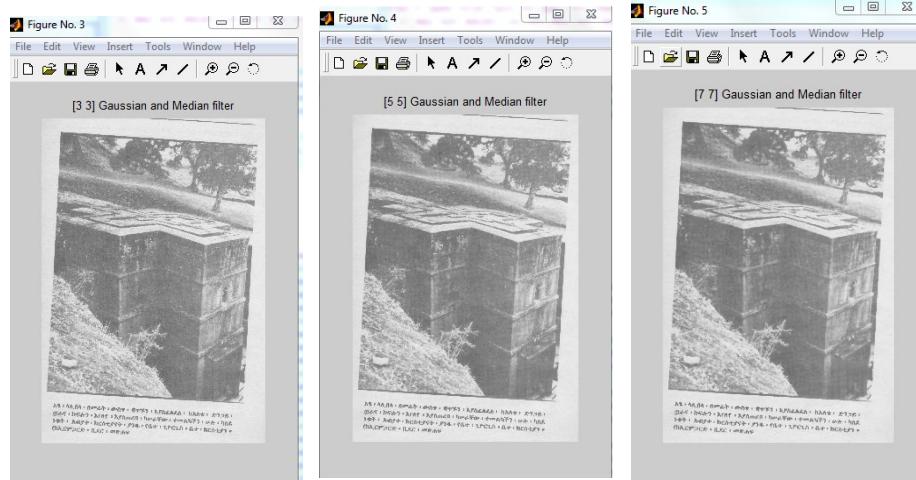


Figure 59: Gaussian and Median

## Original Image

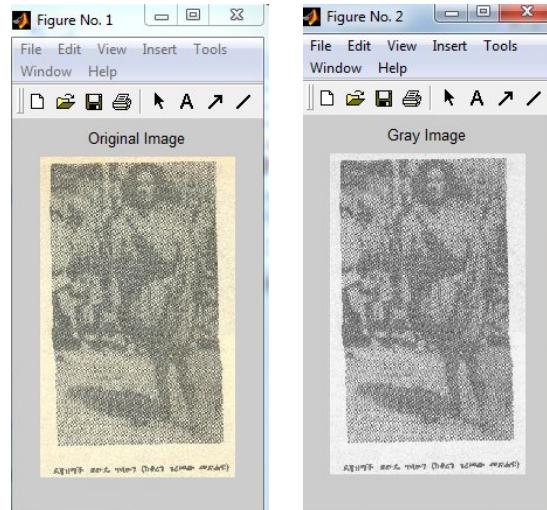


Figure 60: Original Image

## Gaussian and Adaptive

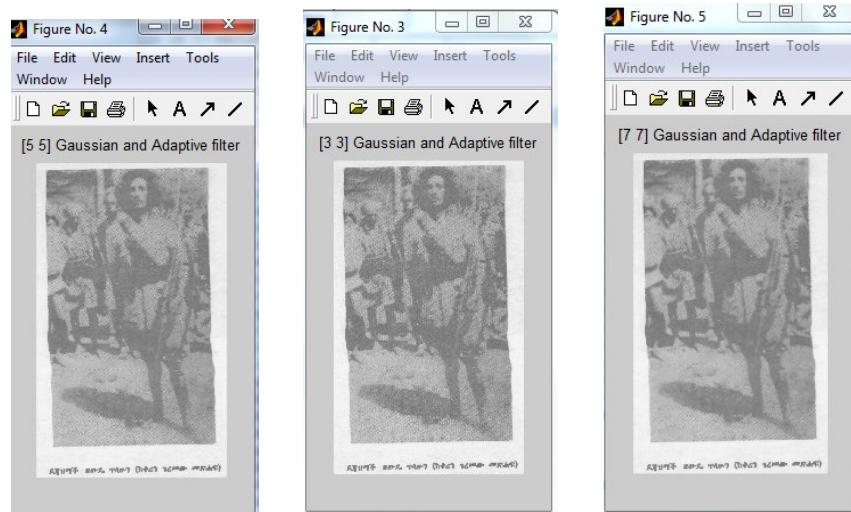
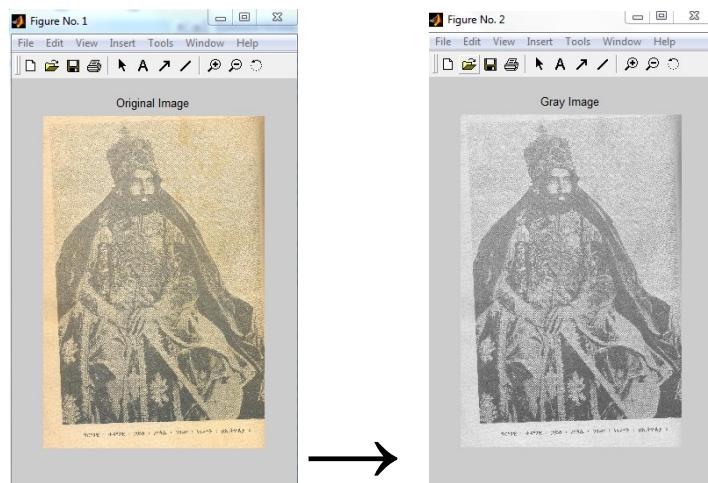


Figure 61: Gaussian and Adaptive filter

## Original Image



## Median and Adaptive

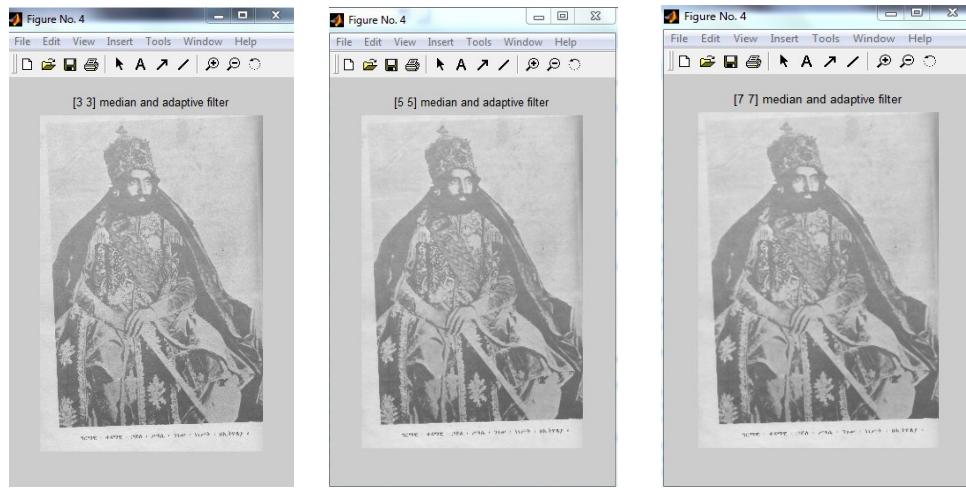


Figure 62: Median and Adaptive filter

## Median and imadjust

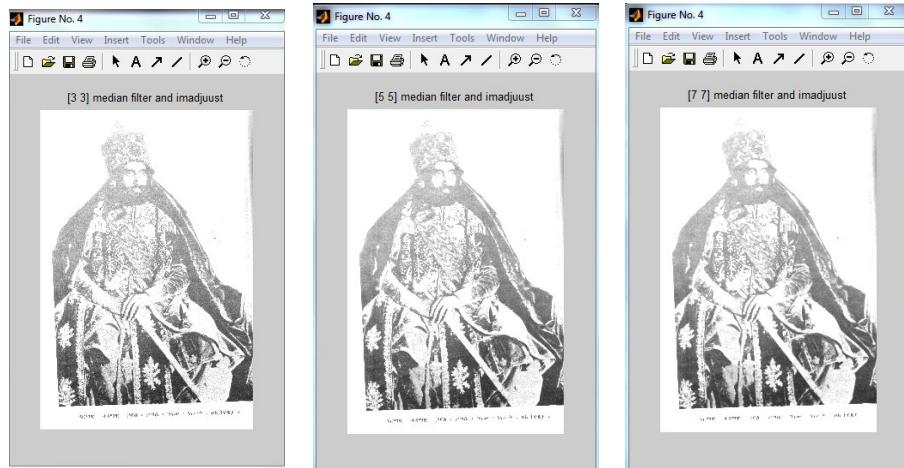


Figure 63: Median and Imadjust filter

## Adaptive and imadjust

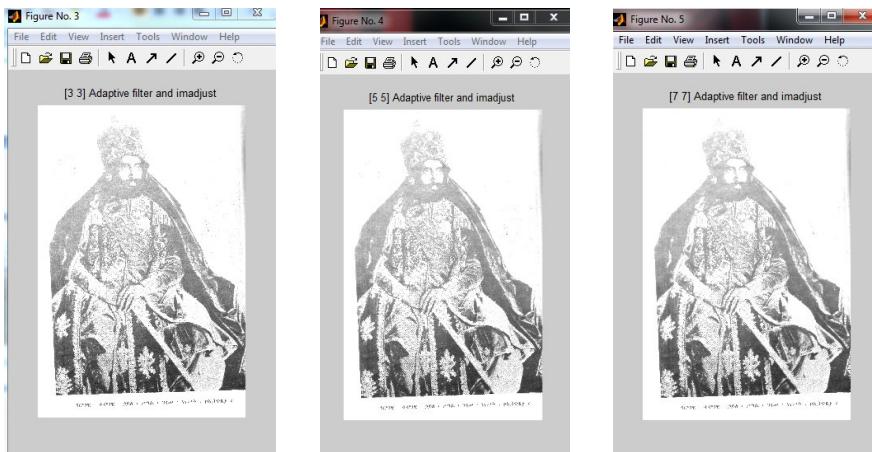


Figure 64: Adaptive and imadjust

## Original Image

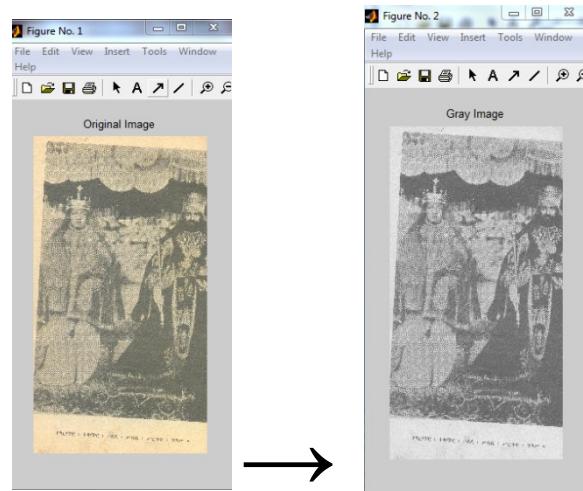


Figure 65: Original Image

## Gaussian and imadjust

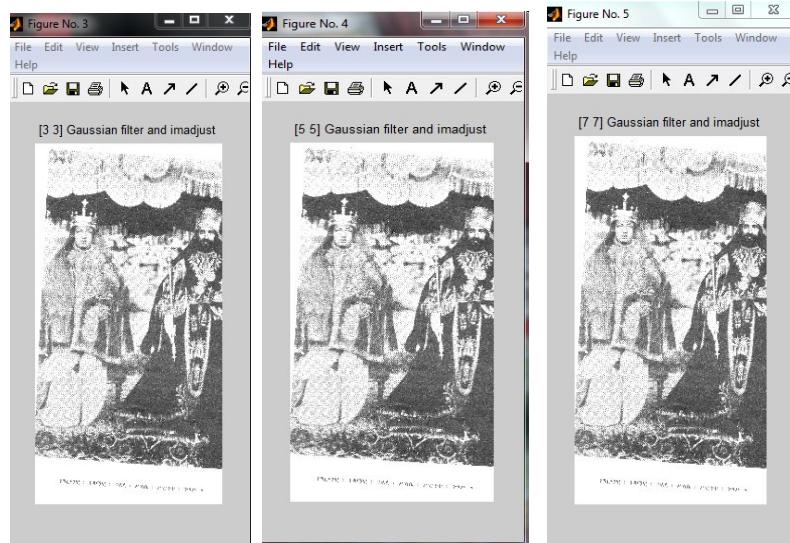


Figure 66: Gaussian and imadjust filter

## Average and imadjust

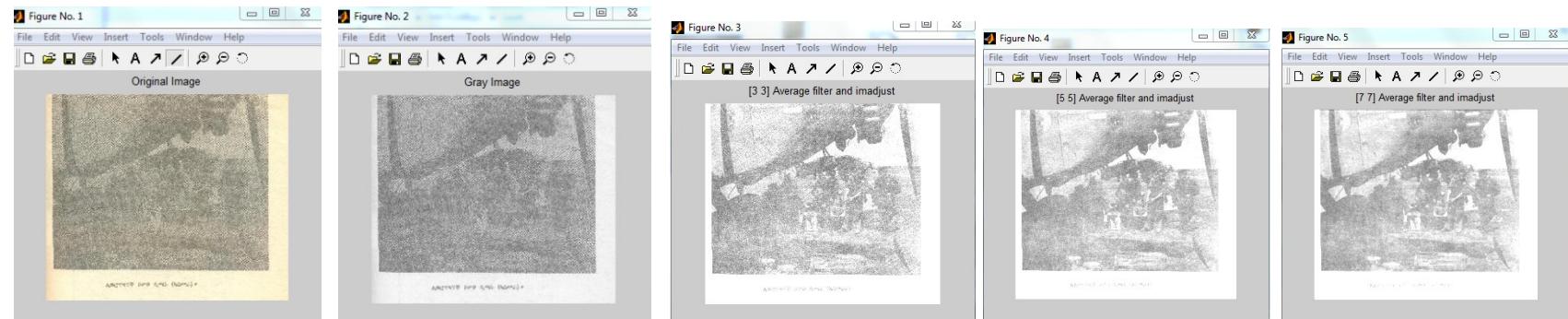


Figure 67: Average and imadjust filter

## 1. Filtering the image after converting it in to Binary

### Original Image



Figure 68: Original Image

### Adaptive filtering

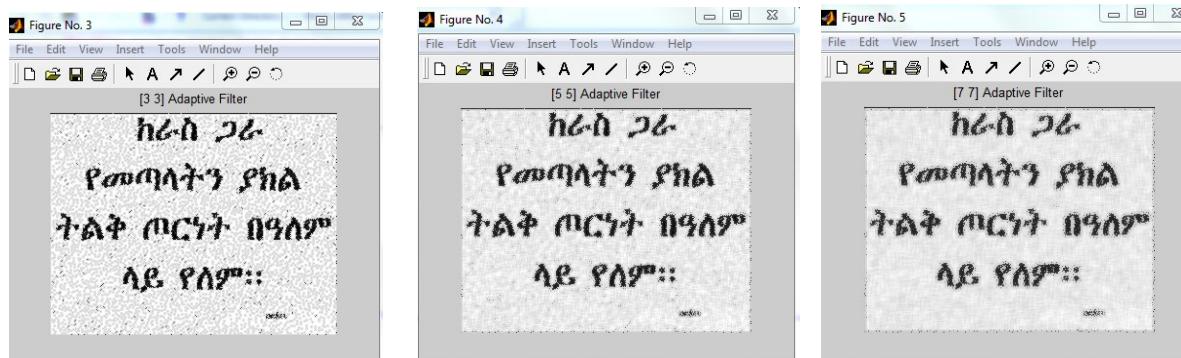


Figure 69: Adaptive filter

## Median filtering

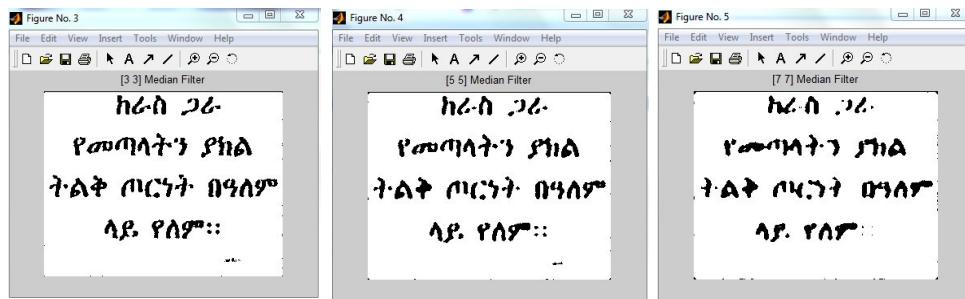


Figure 70: Median Filter

## Minimum Filtering

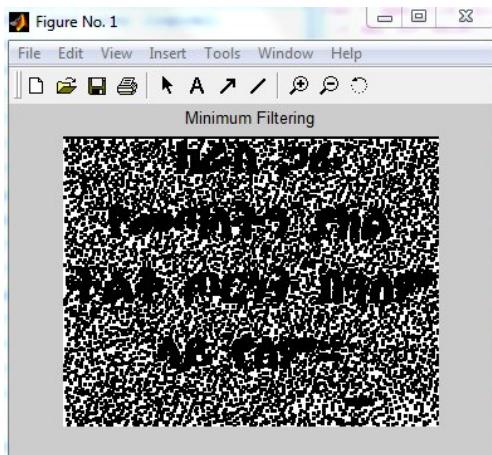


Figure 71: Minimum filter

## Maximum Filtering

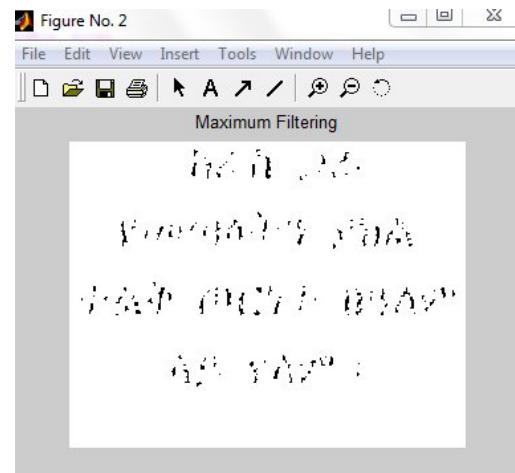


Figure 72: Maximum Filtering

## Binary Area Open

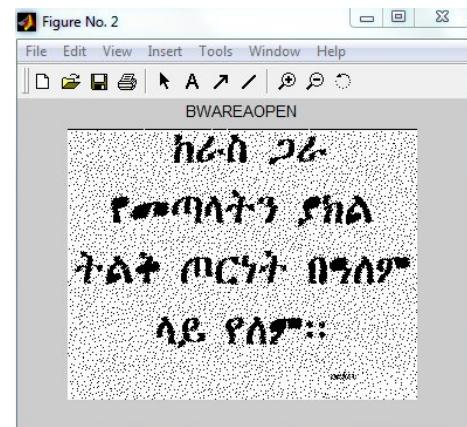


Figure 73: Binary Area Open

## Sobel

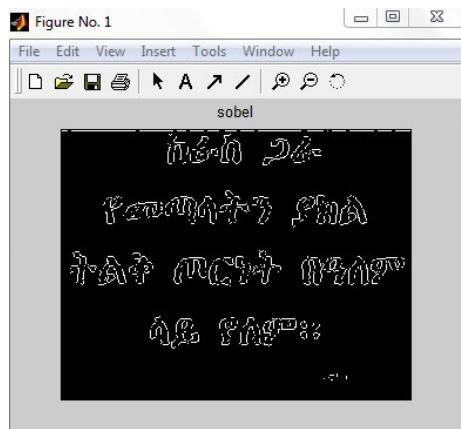


Figure 74: sobel

## Canny

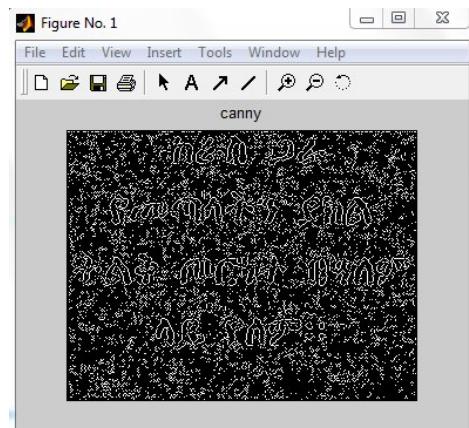


Figure 75: Canny

## LoG

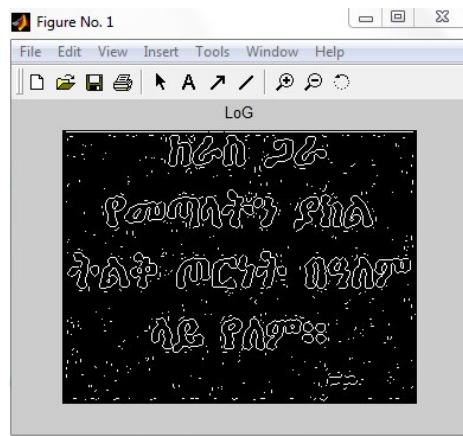


Figure 76: LoG

## Median and Adaptive

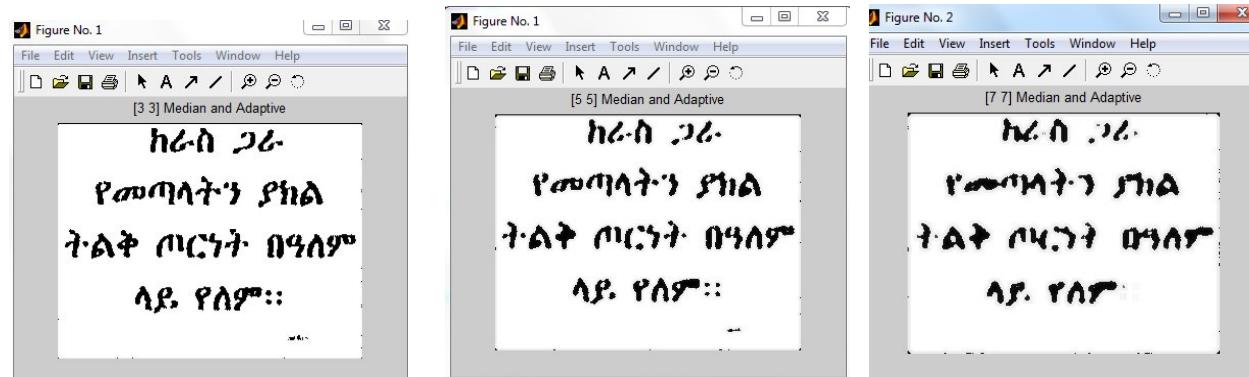


Figure 77: Median Adaptive

## Adaptive and Median

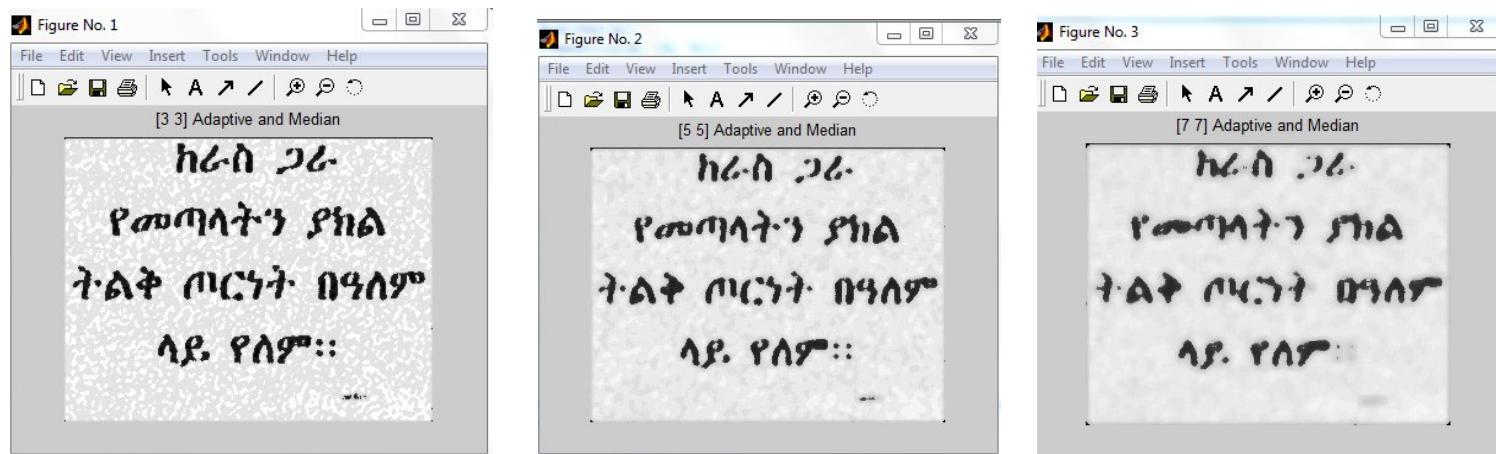


Figure 78: Adaptive and Median

## Sobel and Adaptive

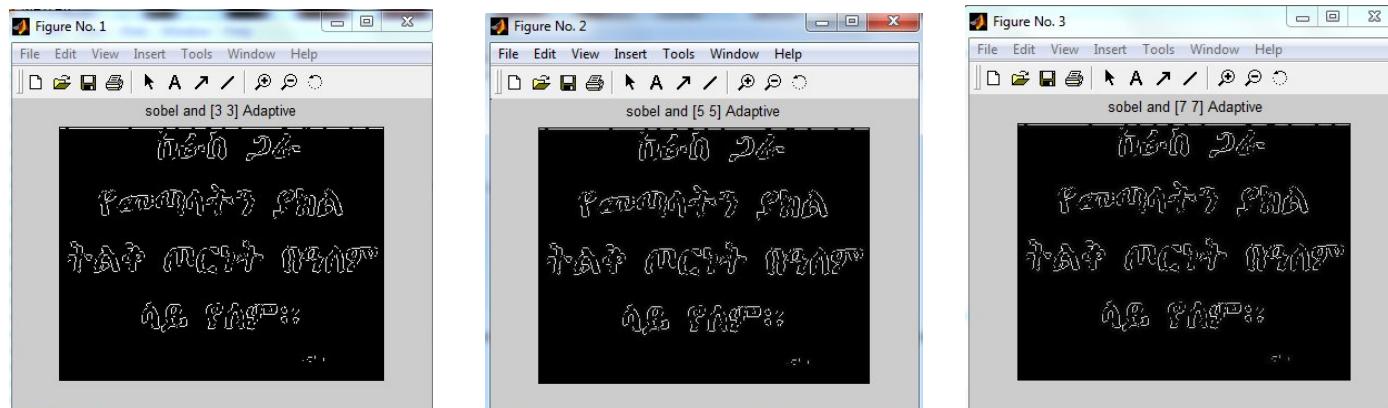


Figure 79: sobel and Adaptive

## Canny and Adaptive

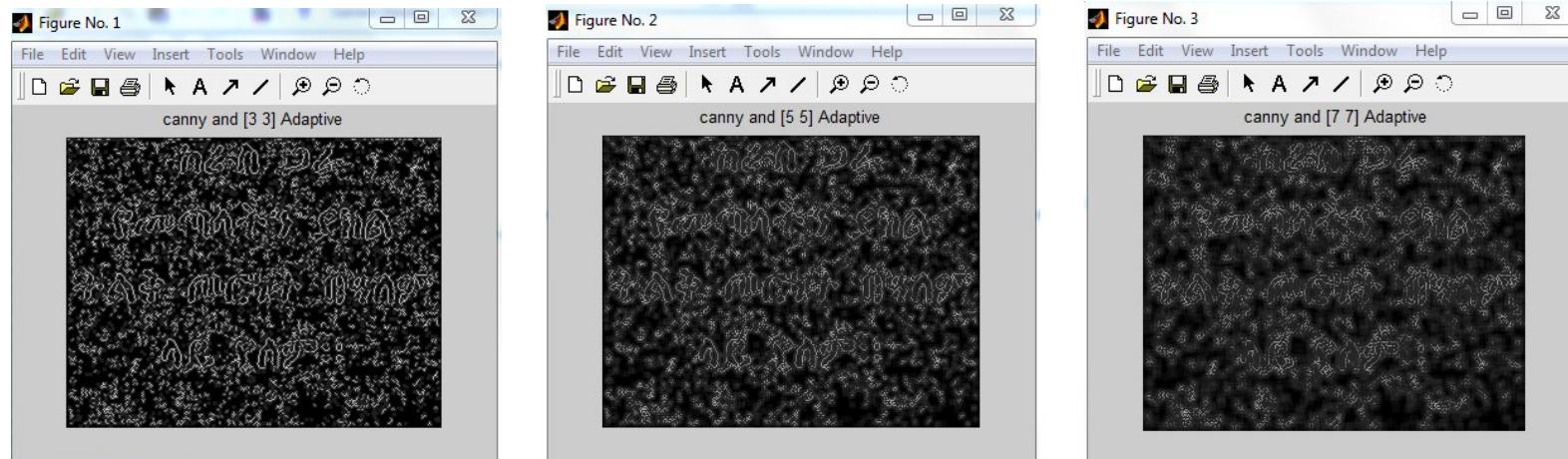


Figure 80: Canny and Adaptive

## LoG and Adaptive

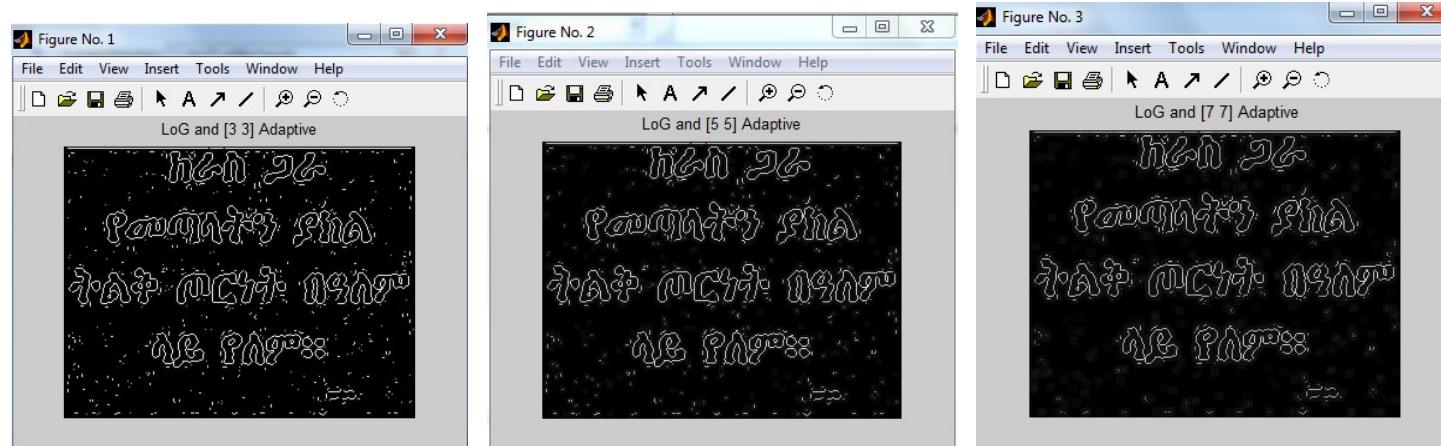


Figure 81: LoG and Adaptive