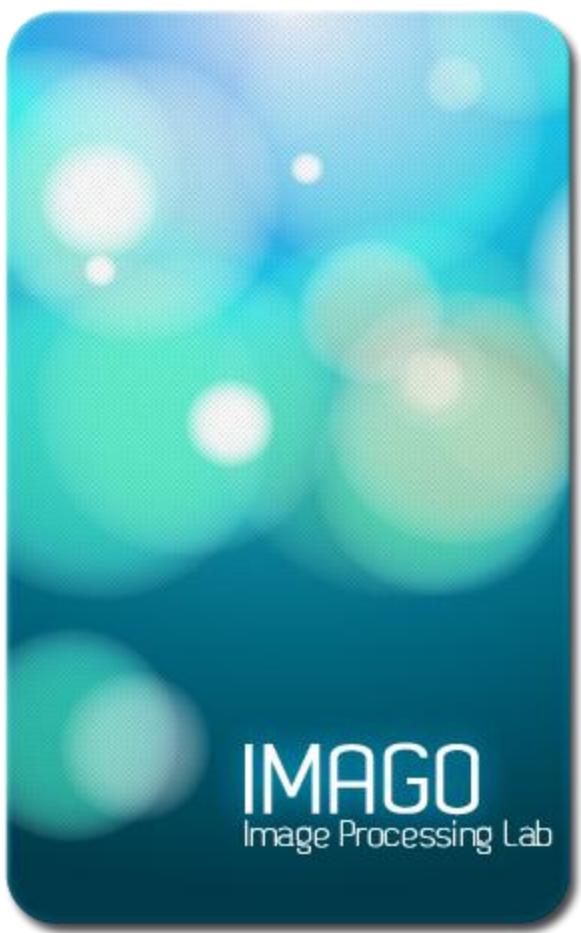


# iMago®

# User Guide



Product release: 1.0  
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# Preface

## Overview

iMago is an image processing package which contains a lot of image a lot of segmentation, restoration, morphology, enhancement algorithms in spatial and frequency domain with friendly user interface.

## Purpose

This guide is intended to show the functionality of iMago and how to use the features into it.

## Developed by:



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# Image Manipulation

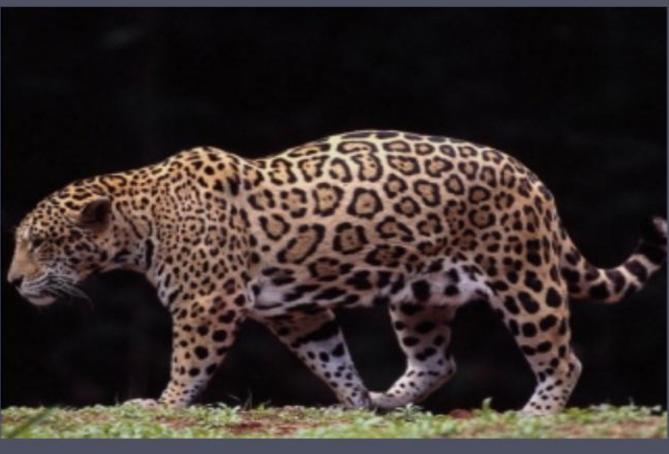
## Image Resizing:

*Main Menu → Image → Resize*

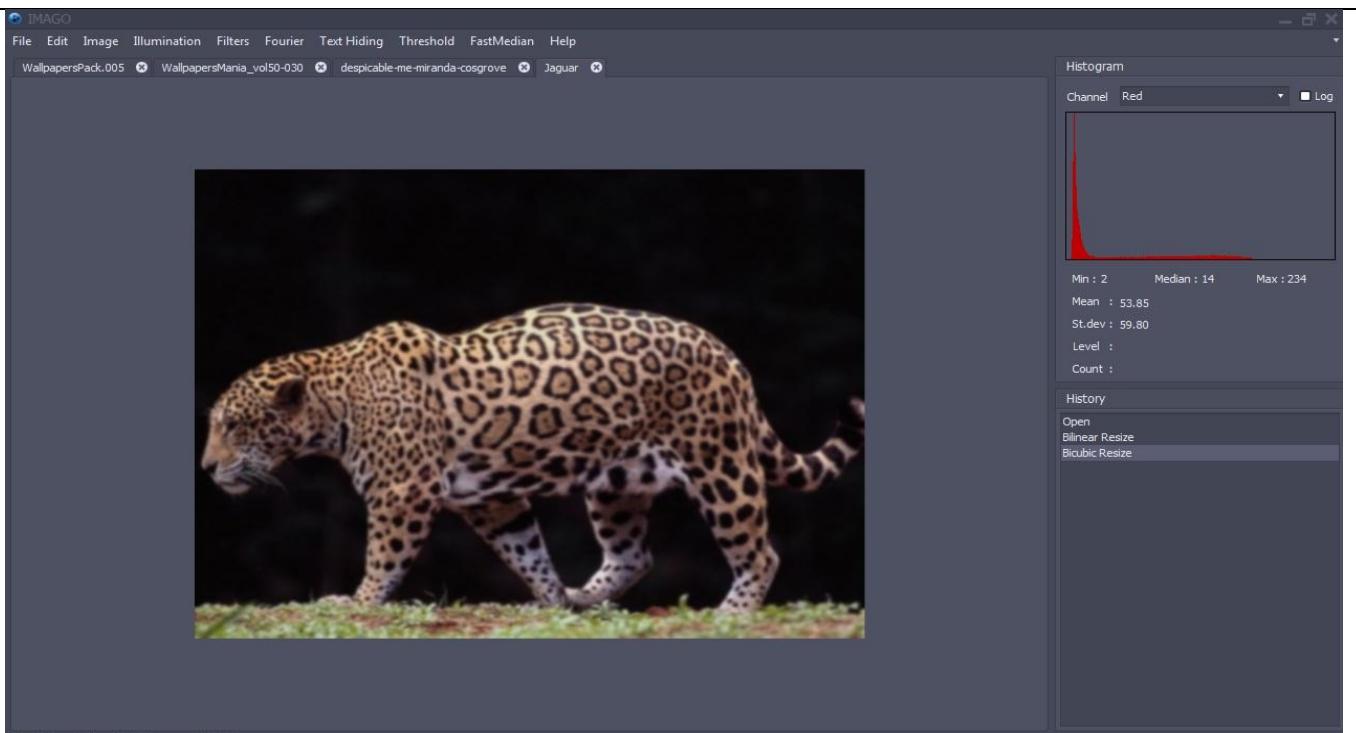
There are three methods for image resizing:

- Bilinear resizing
- Bicubic resizing
- Nearest neighbor resizing

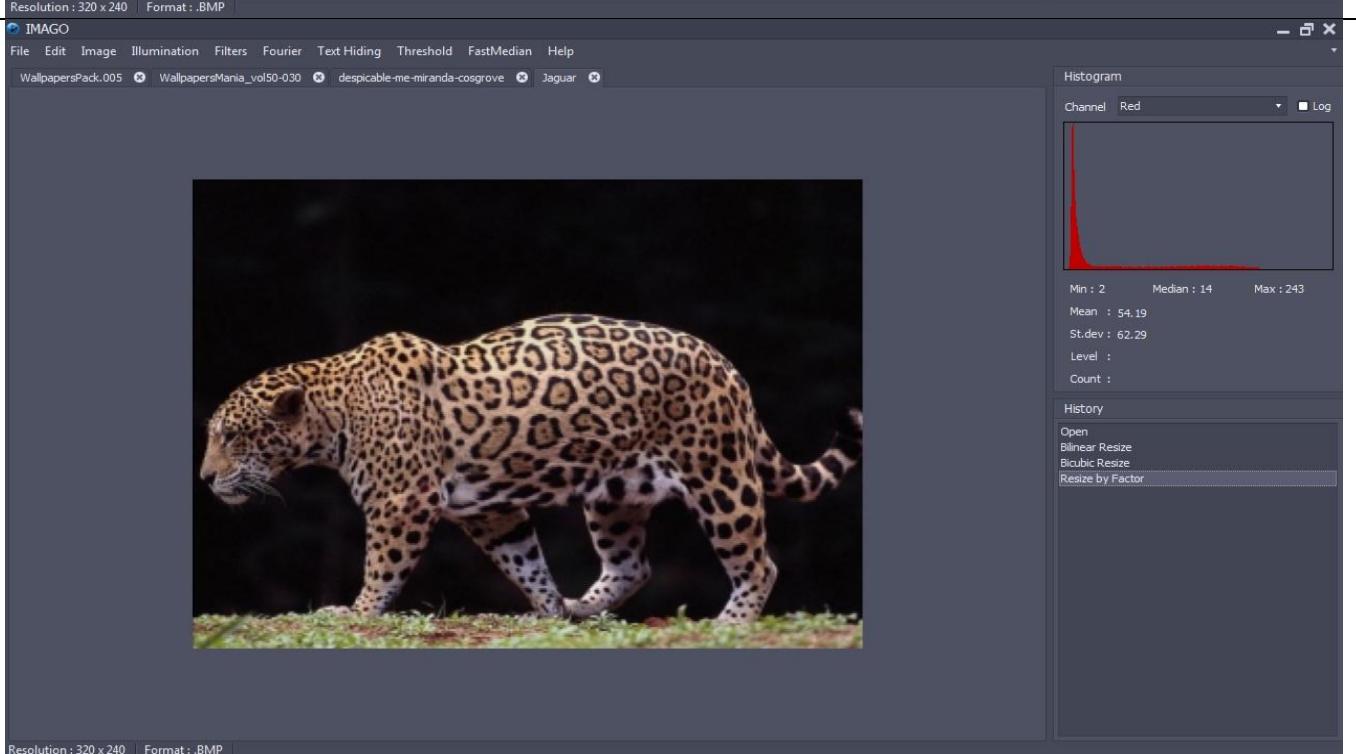
Sample runs:

Original Image	
Bilinear Resizing	 <b>IMAGO</b> File Edit Image Illumination Filters Fourier Text Hiding Threshold FastMedian Help WallpapersPack.005 WallpapersMania_vol50-030 despicable-me-miranda-cosgrove Jaguar Resolution : 320 x 240 Format : .BMP <div style="float: right; margin-top: 20px;"> Histogram  Channel Red Log  Min : 2 Median : 14 Max : 243  Mean : 54.11 St.dev : 61.22 Level :  Count :  History  Open Bilinear Resize </div>

## Bicubic Resizing



## Nearest neighbor resizing



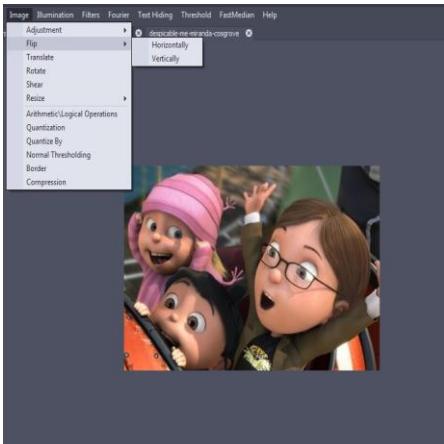
## Image geometric operations

- Flipping
- Translate
- Rotate
- Shear

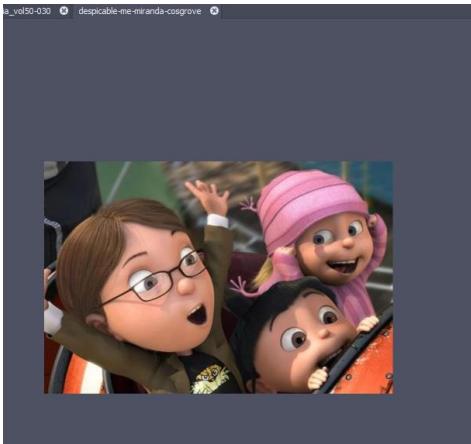
Sample runs:

**Image flipping**  
*Image → Flip → Vertically/Vertically*

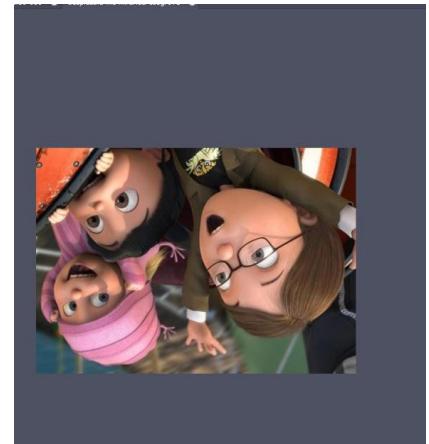
Original Image



Horizontal flipping

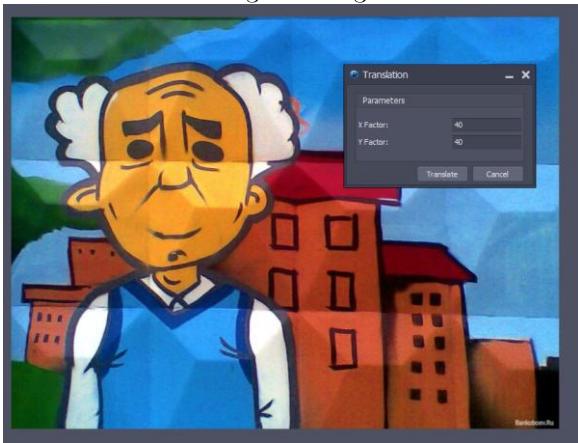


Vertical flipping



**Image translate**  
*Image → Translate*

Original Image



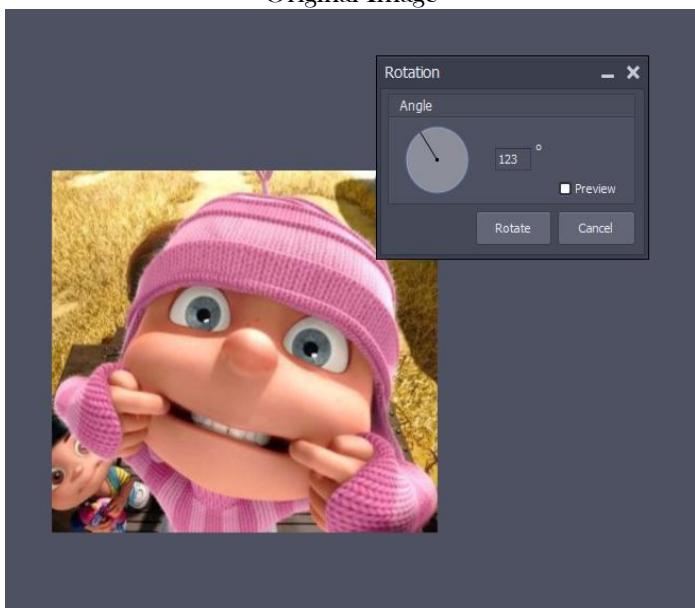
Translated Image



## Image Rotation

*Image → Rotate*

Original Image



Rotated Image



## Image Shear

*Image → Shear*

Original Image



Sheared image

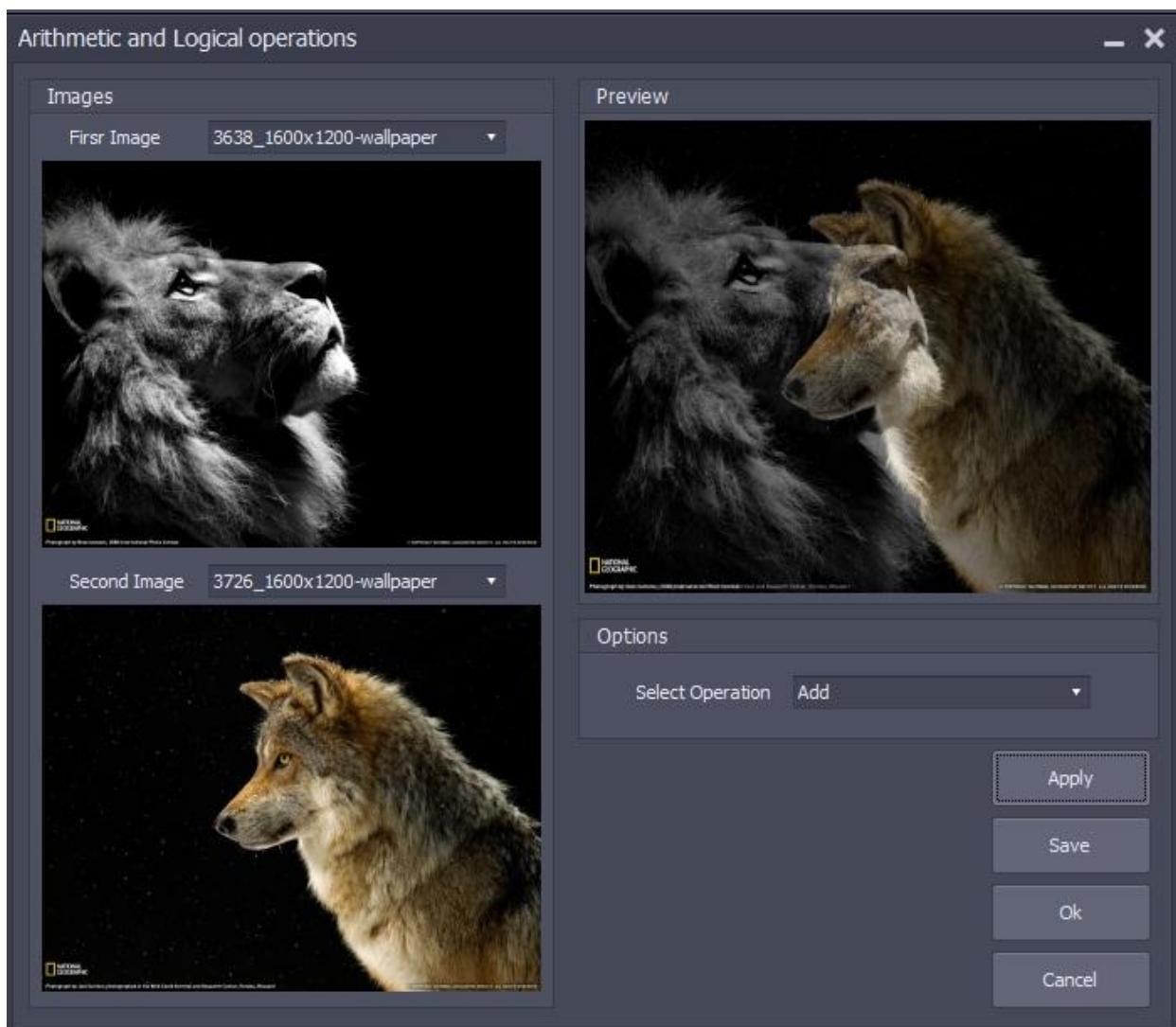


## Arithmetical and Logical operations

- Adding two images
- Subtract an image from another
- AND operation between two images
- OR operation between two images
- Apply NOT operator on an image

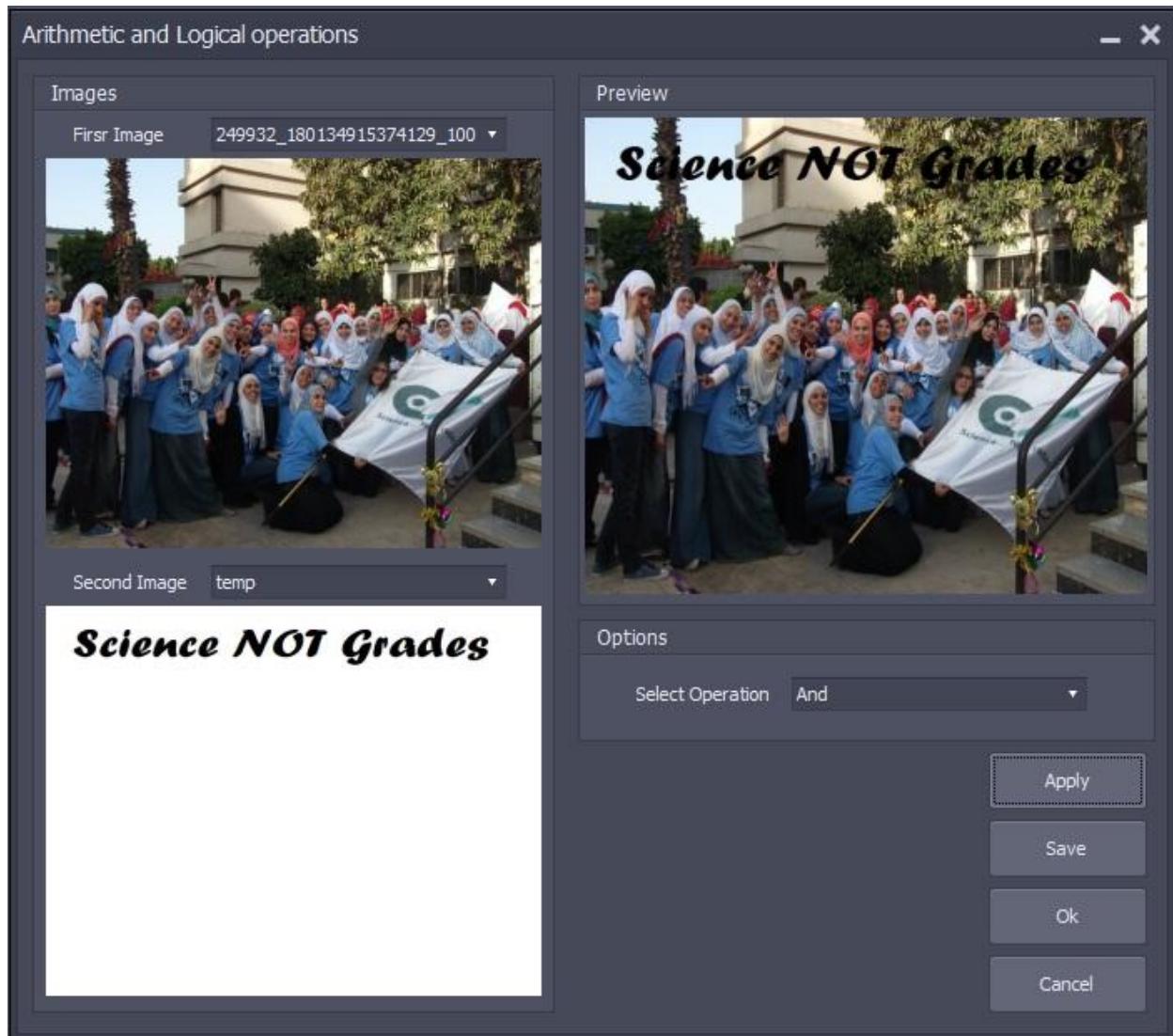
### Add Operation

*Image → Arithmetical/Logical → select first & second image → select add operation → apply*



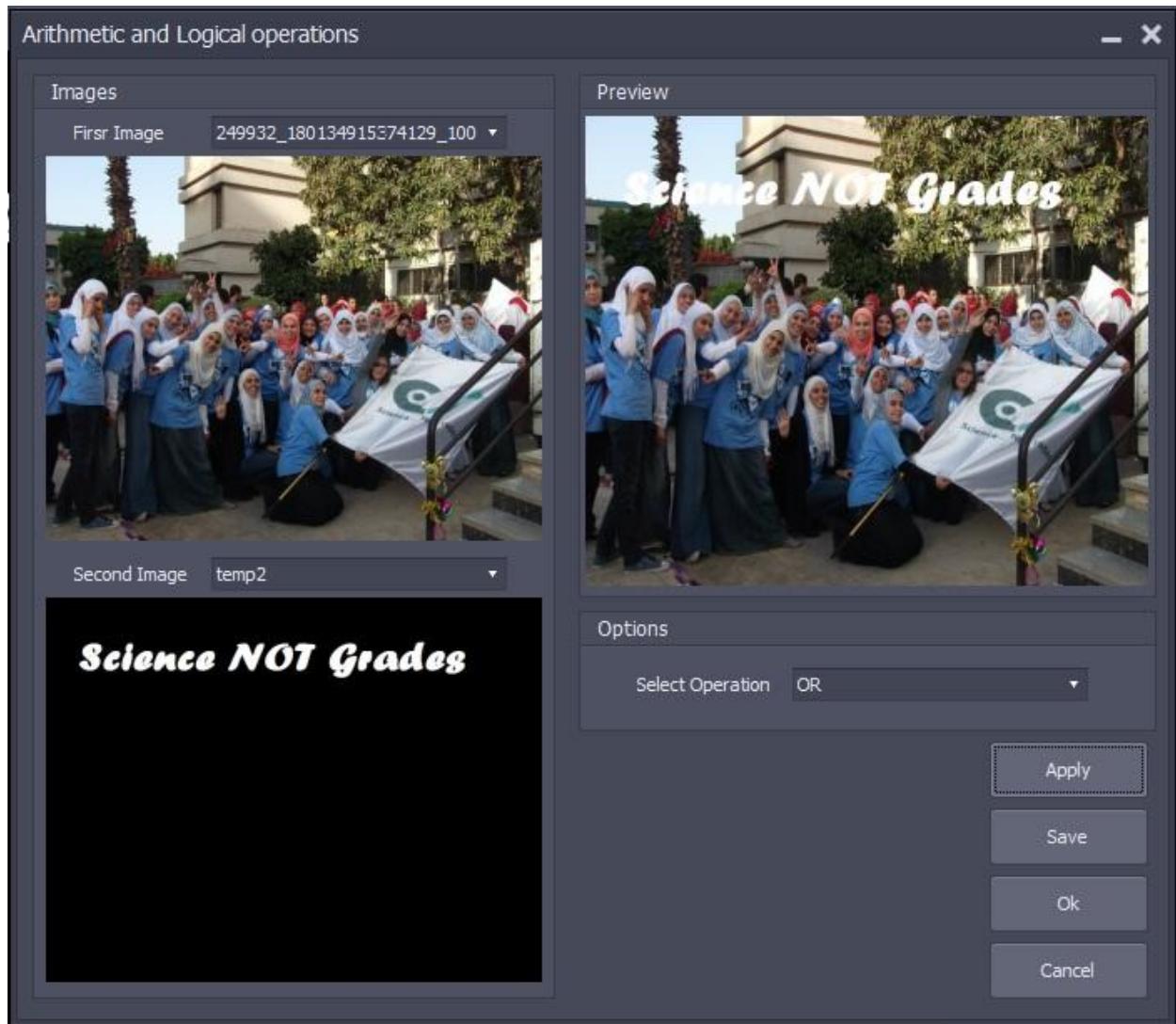
## And Operation

*Image → Arithmetical/Logical → select first & second image → select AND operation → apply*



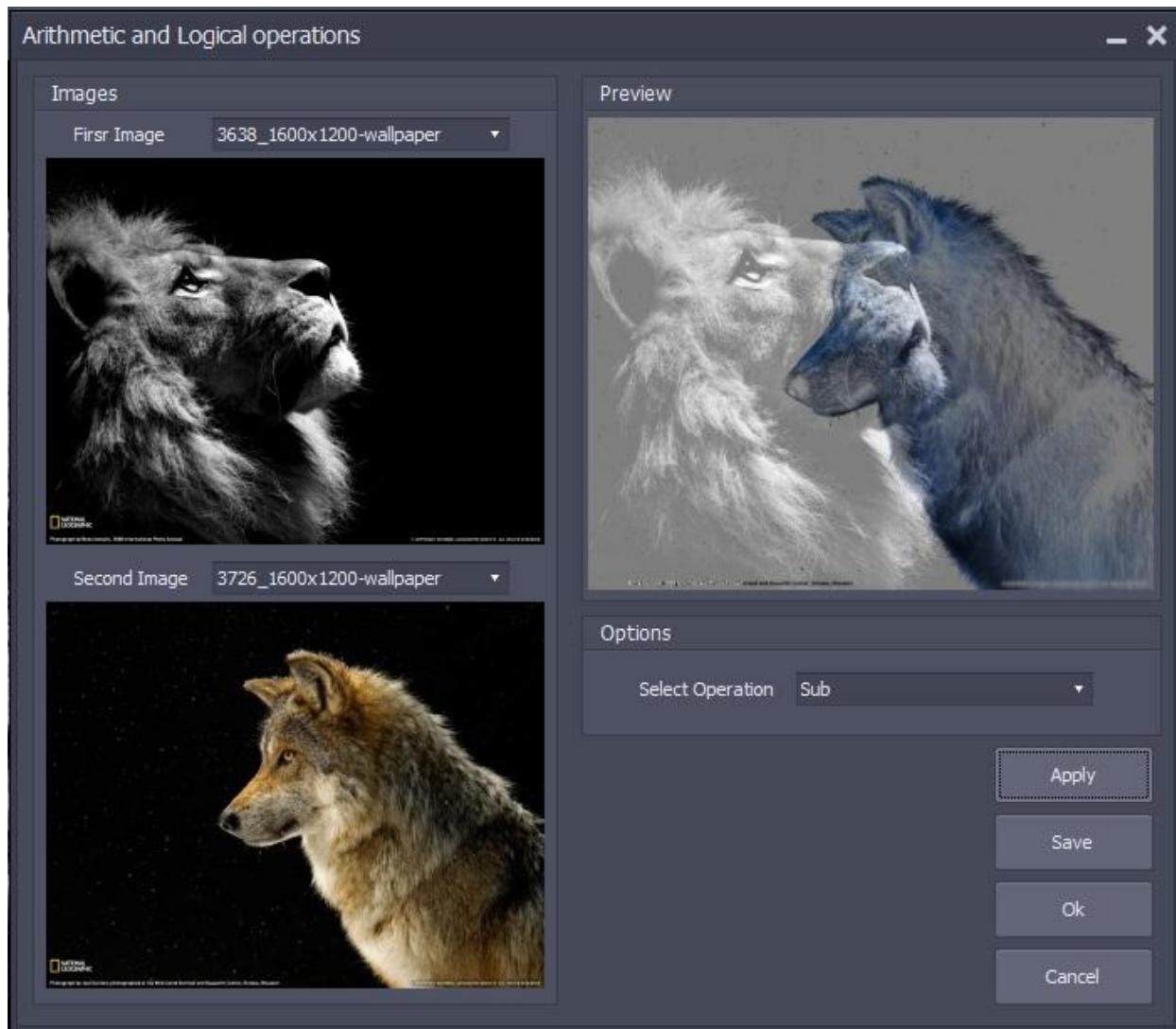
## OR Operation

*Image → Arithmetical/Logical → select first & second image → select OR operation → apply*



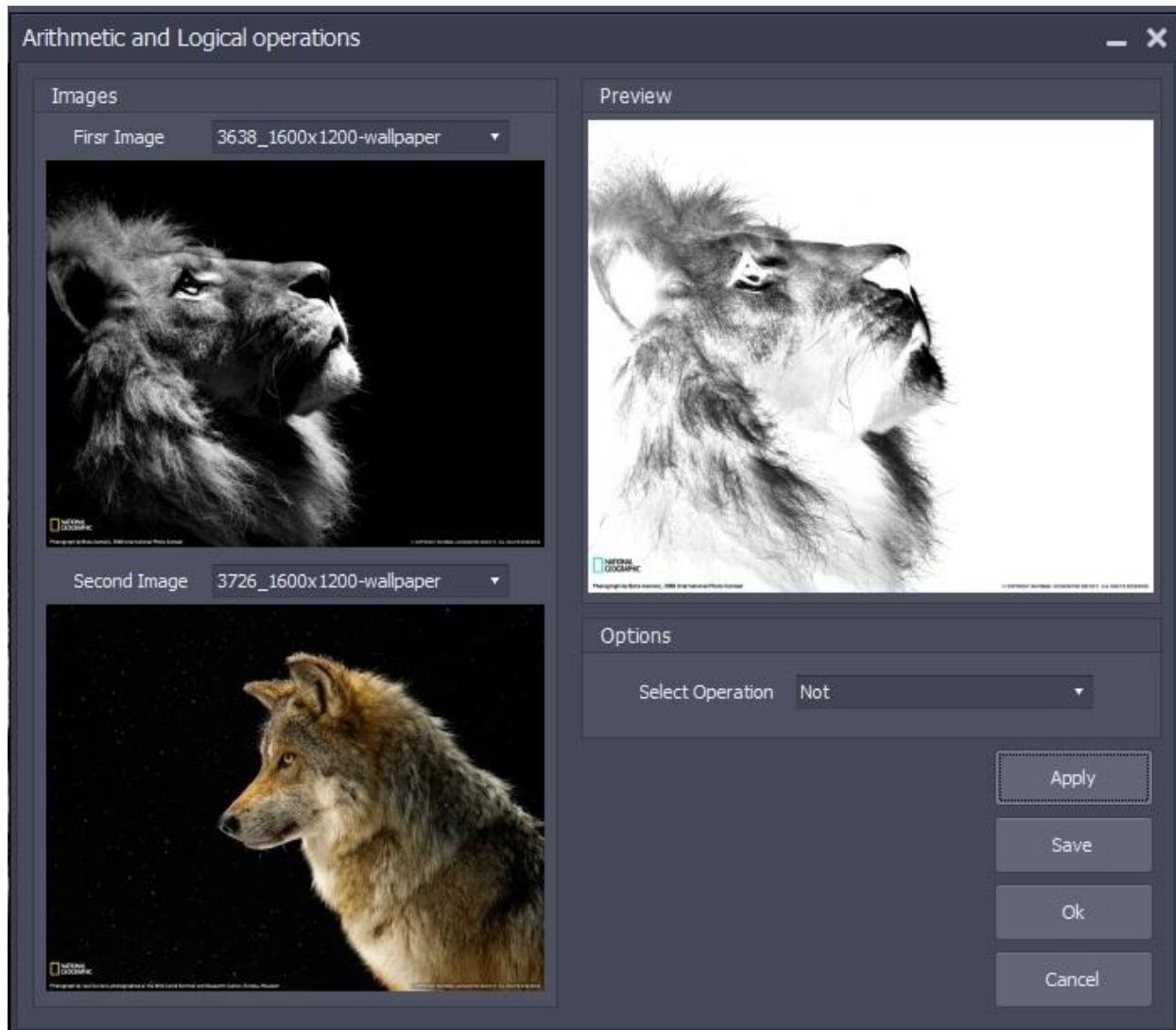
## Subtract Operation

*Image → Arithmetical/Logical → select first & second image → select SUB operation → apply*



## NOT Operation

*Image → Arithmetical/Logical → select the first → select NOT operation → apply*



## Quantization

- Custom quantization per color
- Quantization by specific number of bits per pixels

### Custom quantization

*Image → Quantization → by clicking on the images on the panel you can on/off the selected bit from the result image → apply*



## Quantization by Bpp

*Image → Quantization → enter the number of bits that will represent the result image' pixels → apply*

Original Image



Quantized Image



## Adding Boarders

*Image → borders → select specific border from the combo box → Apply*

Original image

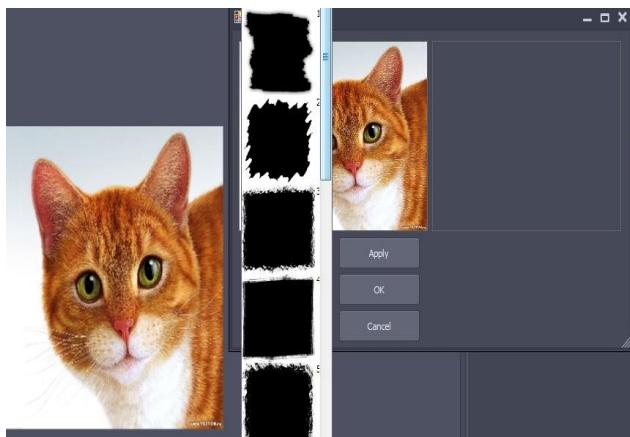
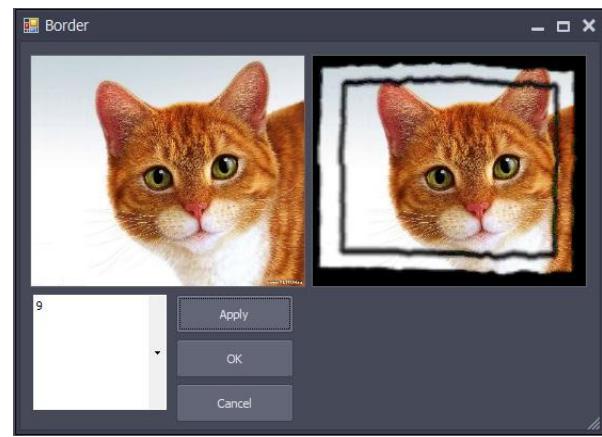


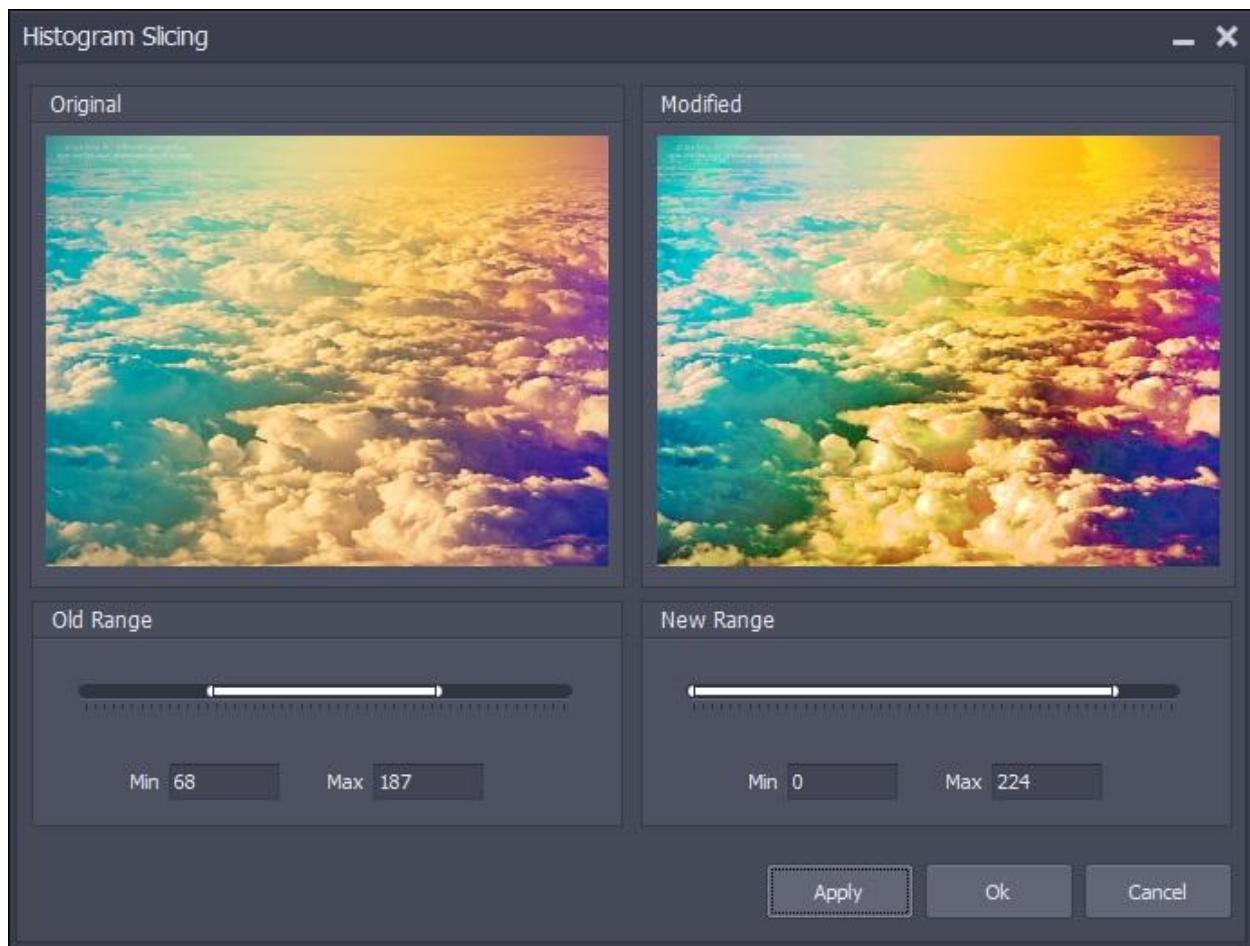
Image after adding border



# Image Illumination

## Histogram Slicing

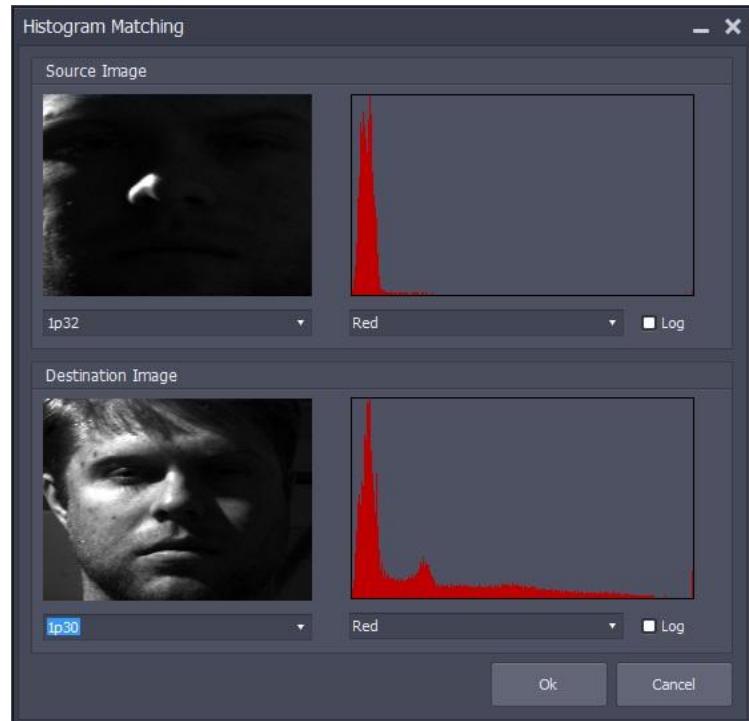
*Illumination → Histogram Slicing → specify ranges → apply*



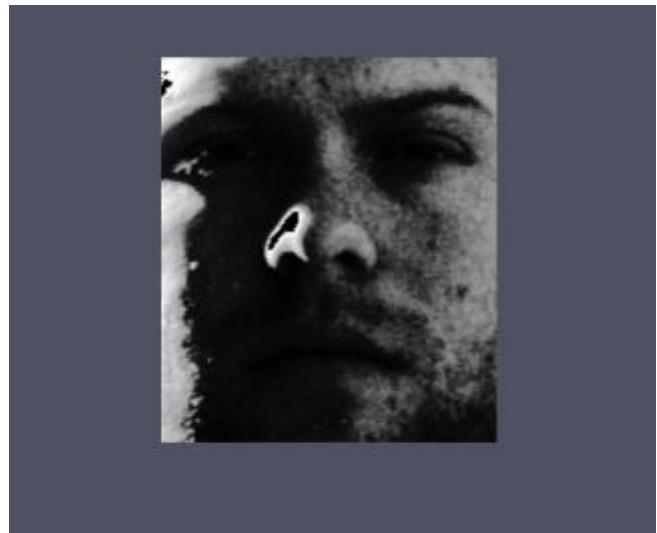
## Histogram Matching

*Illumination → Histogram Matching → select two images → match histograms*

Original Image



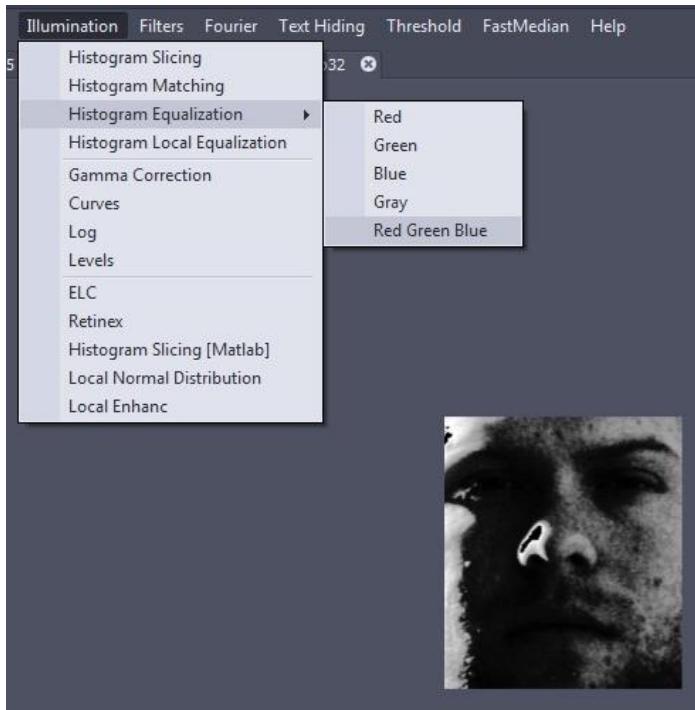
Matched image



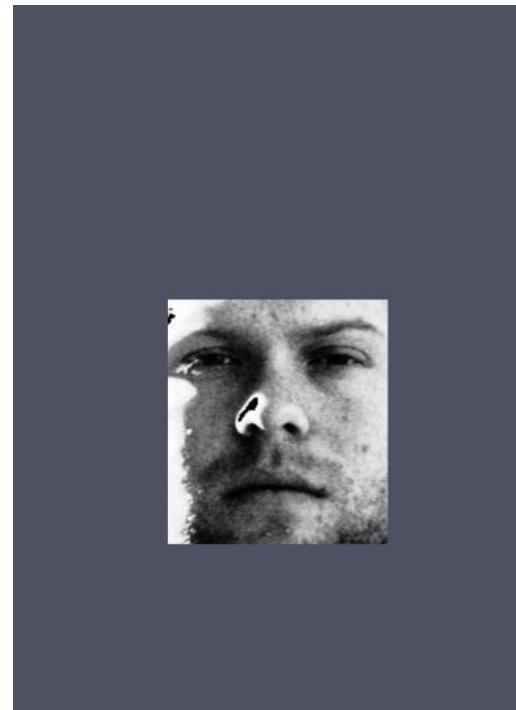
## Histogram equalization

*Illumination → Histogram equalization → select color*

Original Image



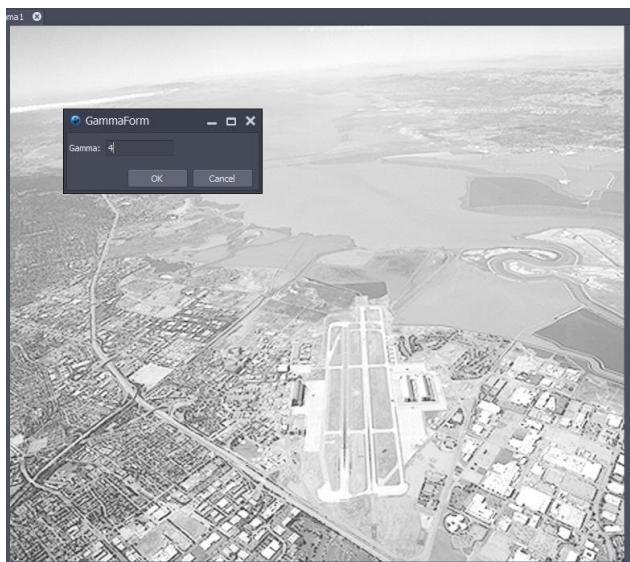
After histogram equalization



## Gamma correction

*Illumination → Gamma Correction → enter gamma value → OK*

Original Image



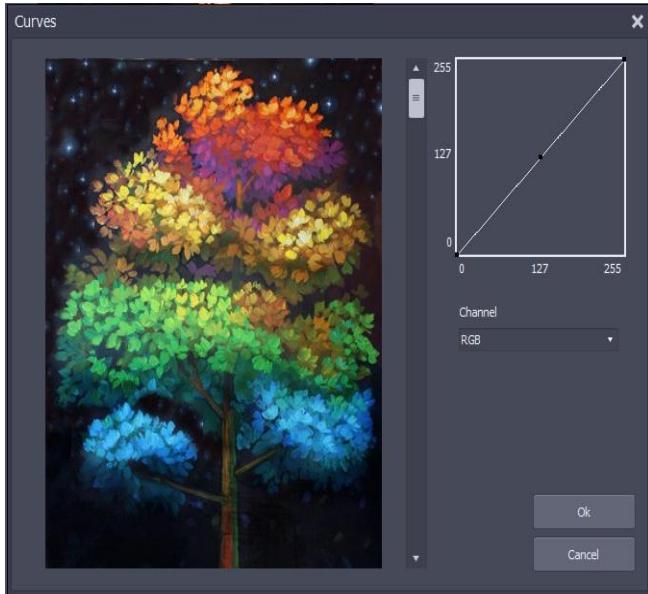
After applying gamma correction



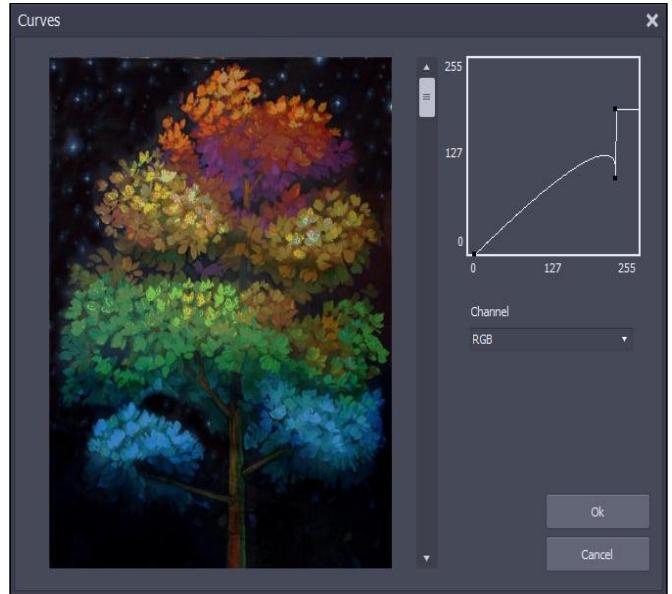
## Applying Curves on images

*Illumination → Curves → draw the curve with mouse → Apply*

Original image



After Apply a curve



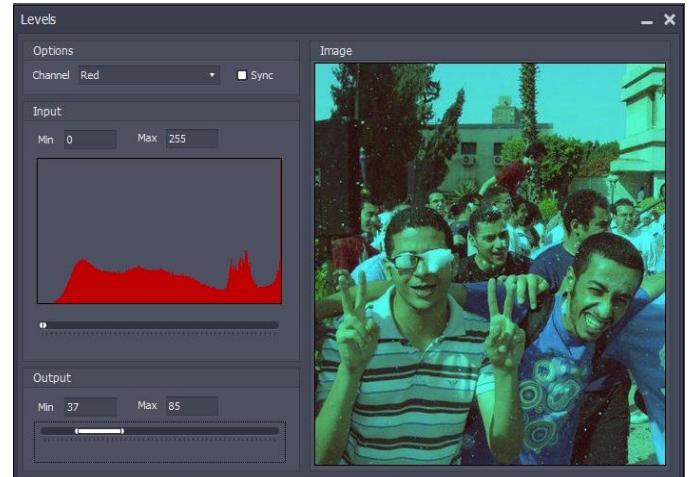
## Histogram Levels

*Illumination → Levels → select histogram type & change the input and output range → OK*

Original Image



Effect 1



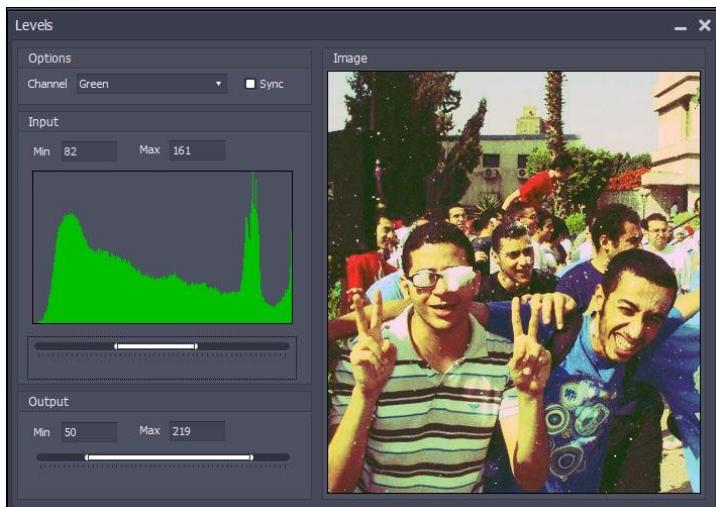
Effect 2



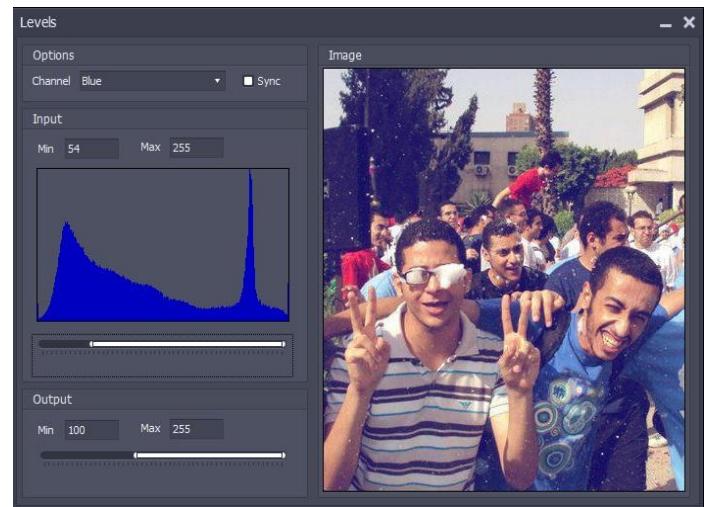
Effect 3



Effect 4



Effect 5

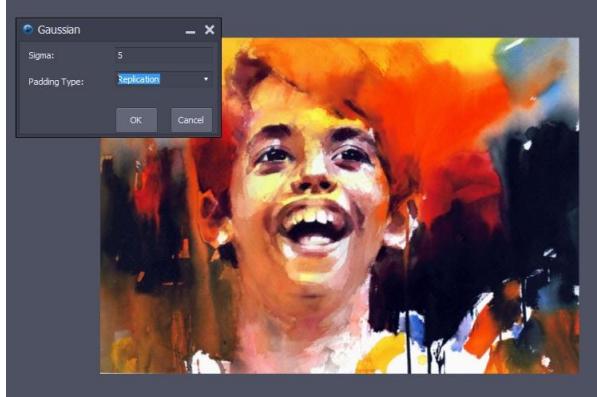


# Image Filtering

## Blurring Filters

*Filters → Blurring → Select filter → Apply*

Original Image



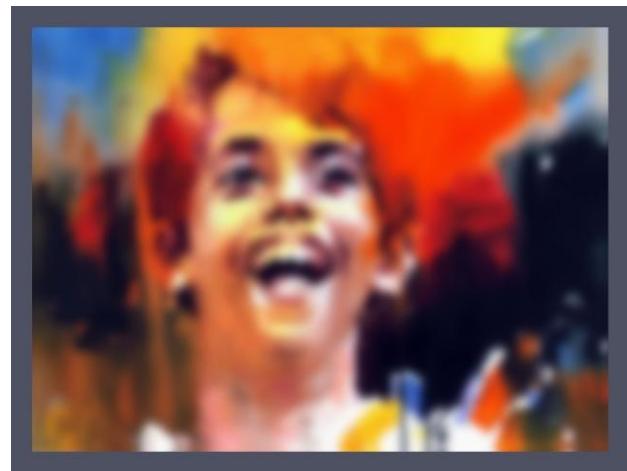
Mean Filter



Weighted Filter



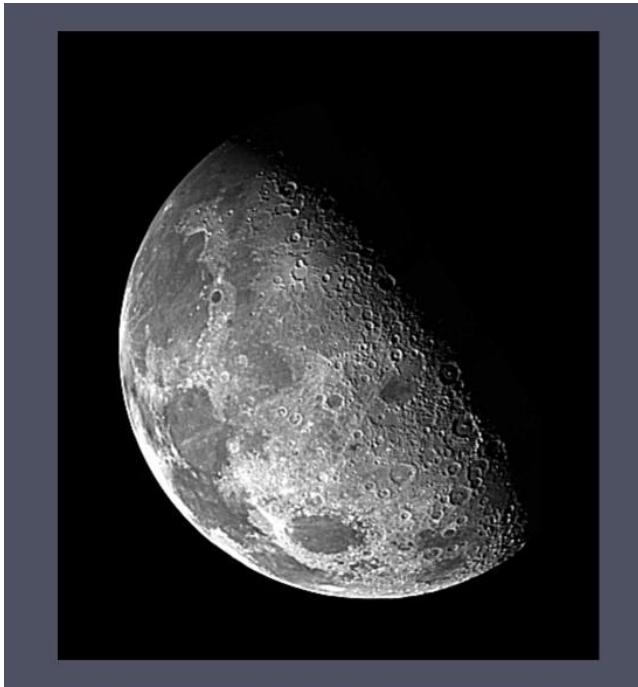
Gaussian Filter



## Sharpening Filters

*Filters → Sharpening → Select filter → Apply*

Laplacian Filter



Horizontal Filter



Vertical Filter



Left Diagonal Filter



Right Diagonal Filter

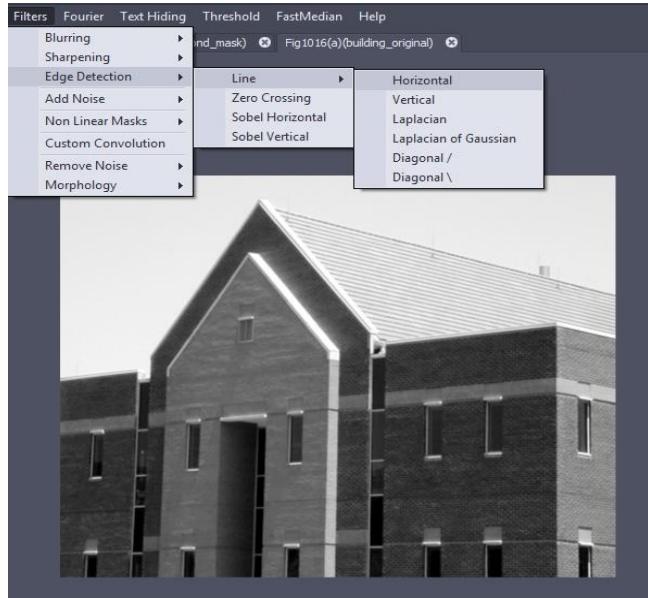
High Boost Filter



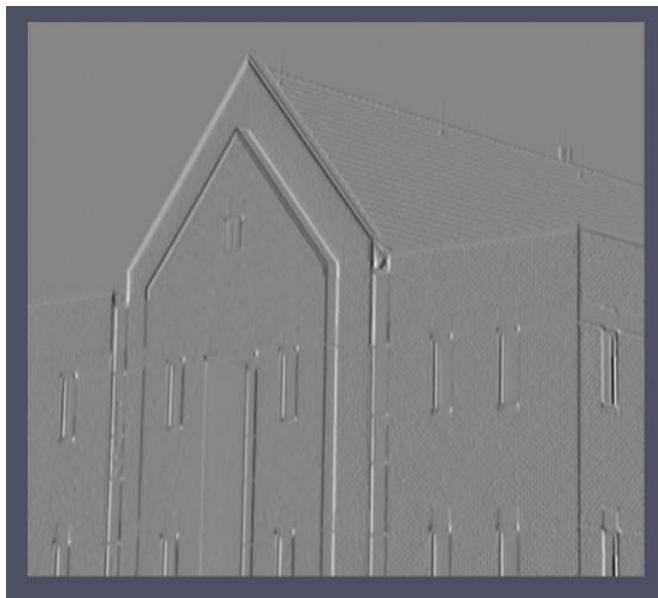
## Edge Detection Filters

*Filters → Edge detection → Select filter → Apply*

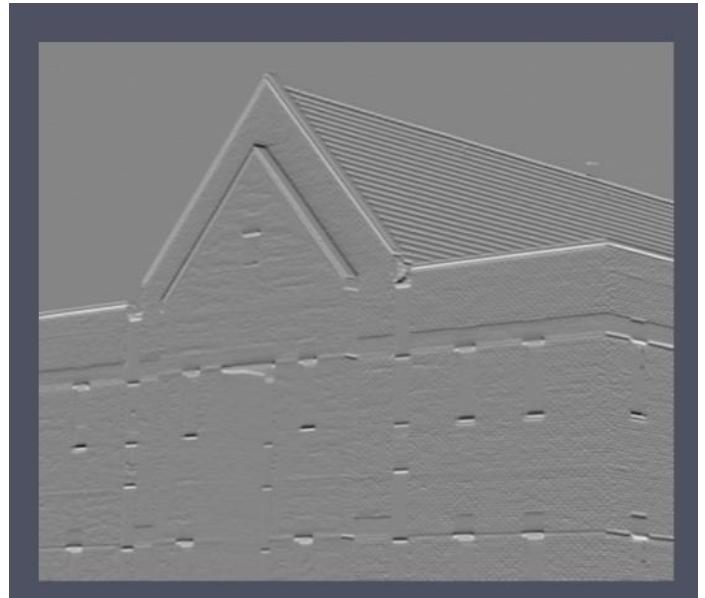
Original Image



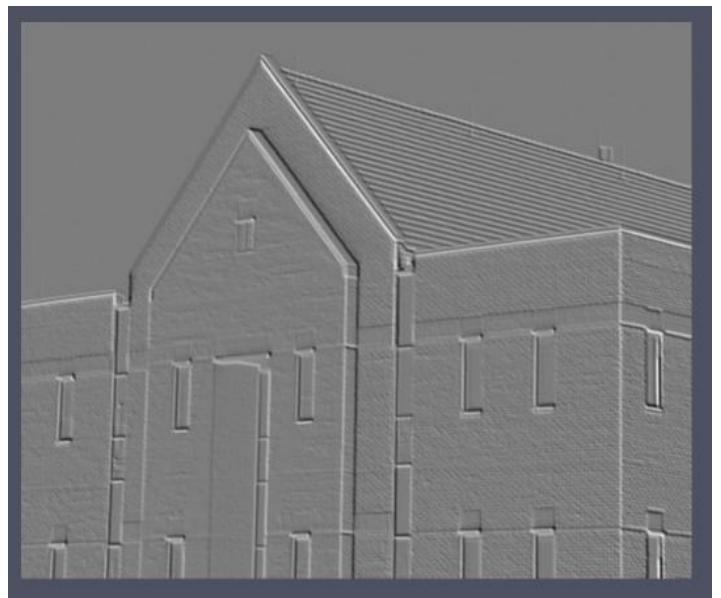
Vertical edge Detection



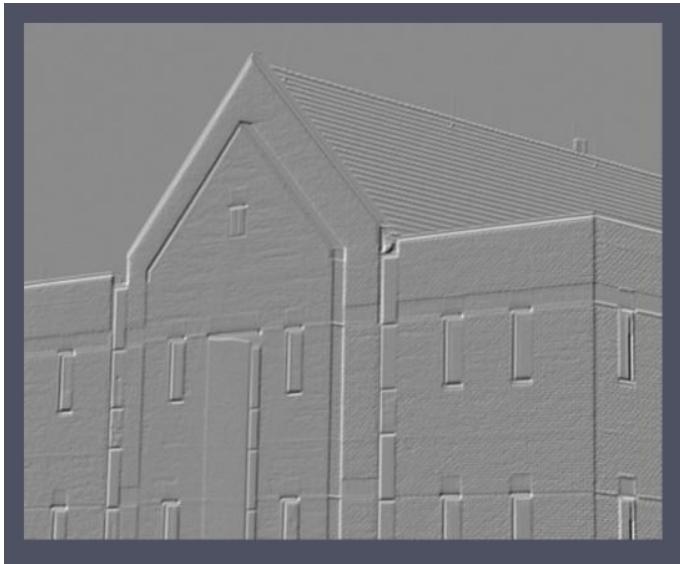
Horizontal Edge detection



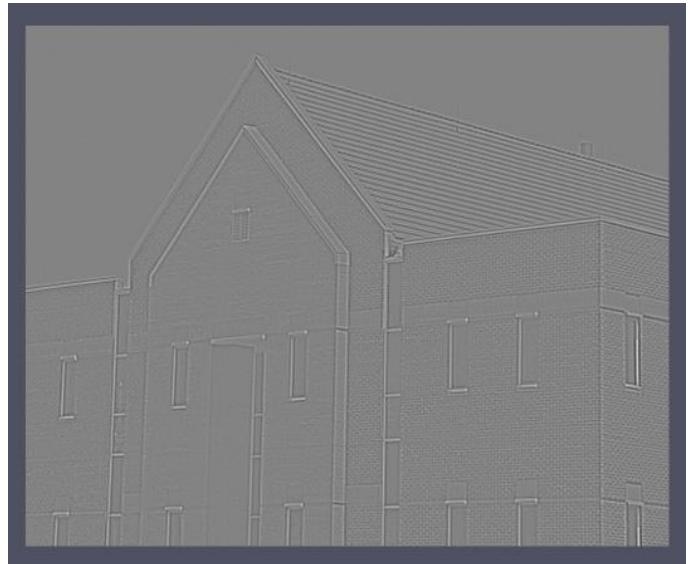
Diagonal 1 Edge Detection



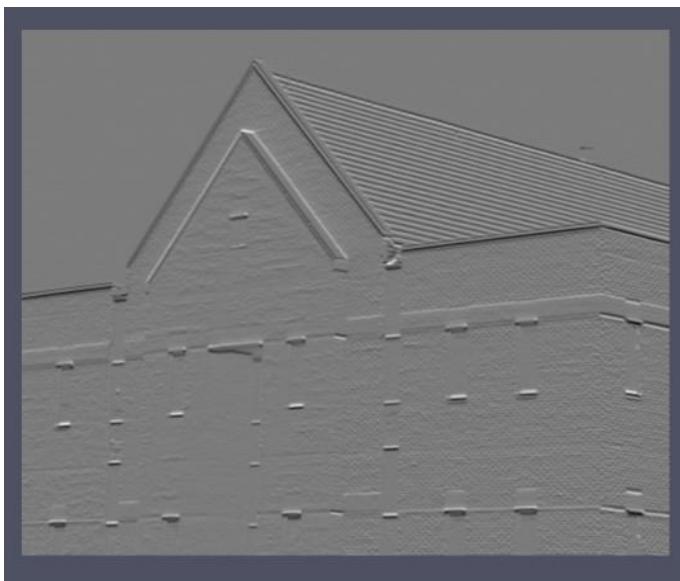
Diagonal 2 Edge Detection



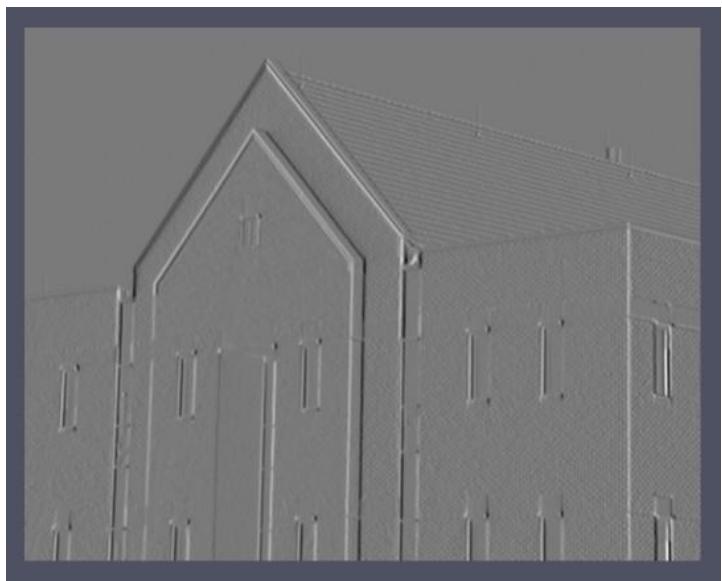
Laplacian Edge Detection



Sobel Horizontal Edge Detection



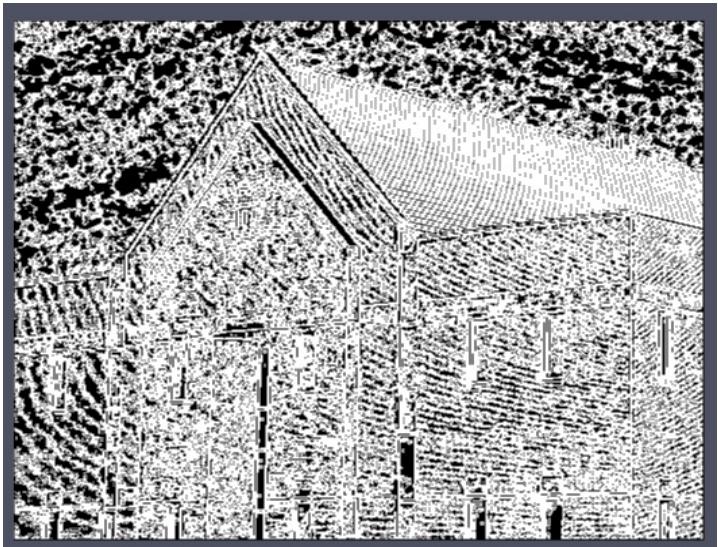
Sobel Vertical Edge Detection



Laplacian of Gaussian Filter



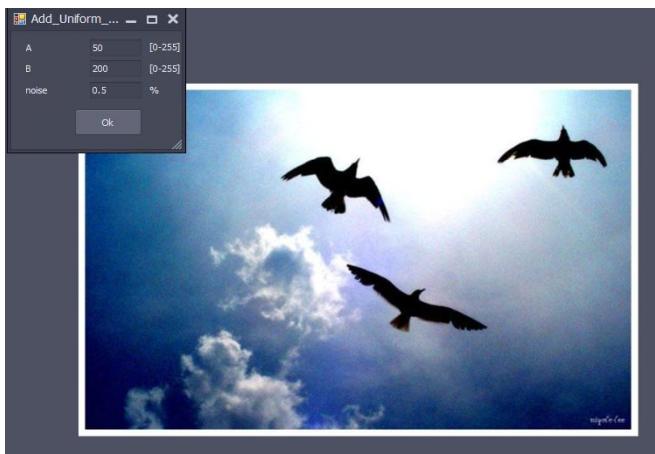
Zero Crossing Edge detection



## Adding Noise

*Filters → Add noise → Select noise type → Apply*

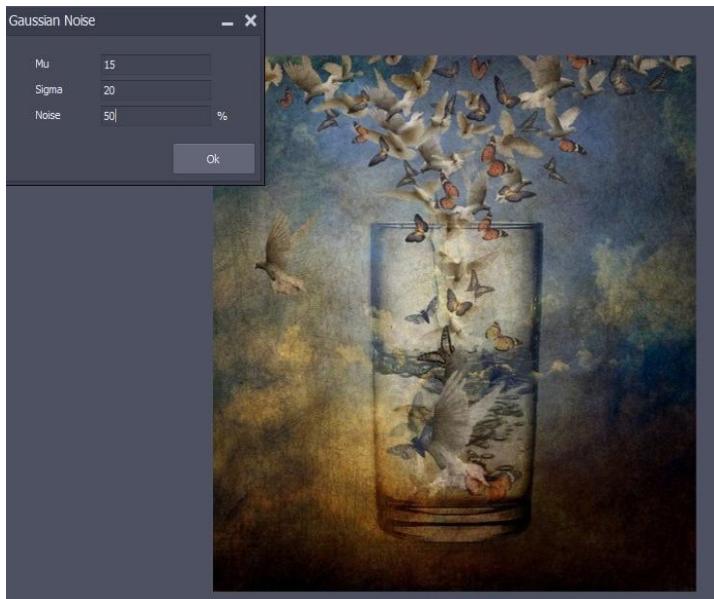
Original Image



After adding uniform noise



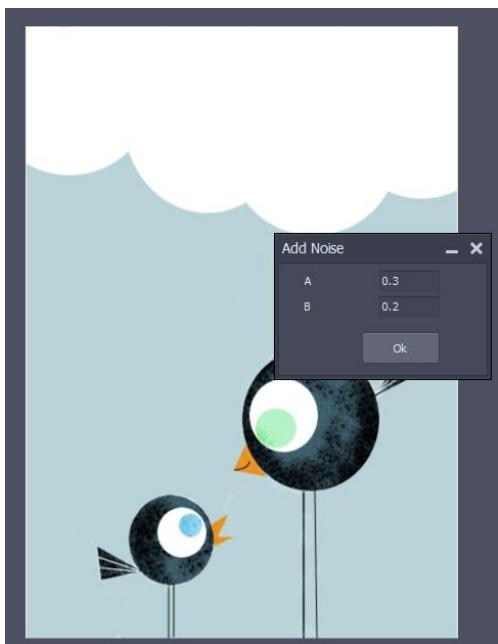
Original Image



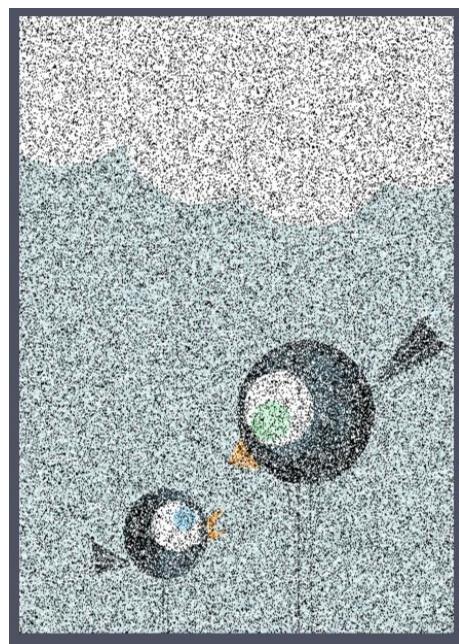
Gaussian Noise



Original Image

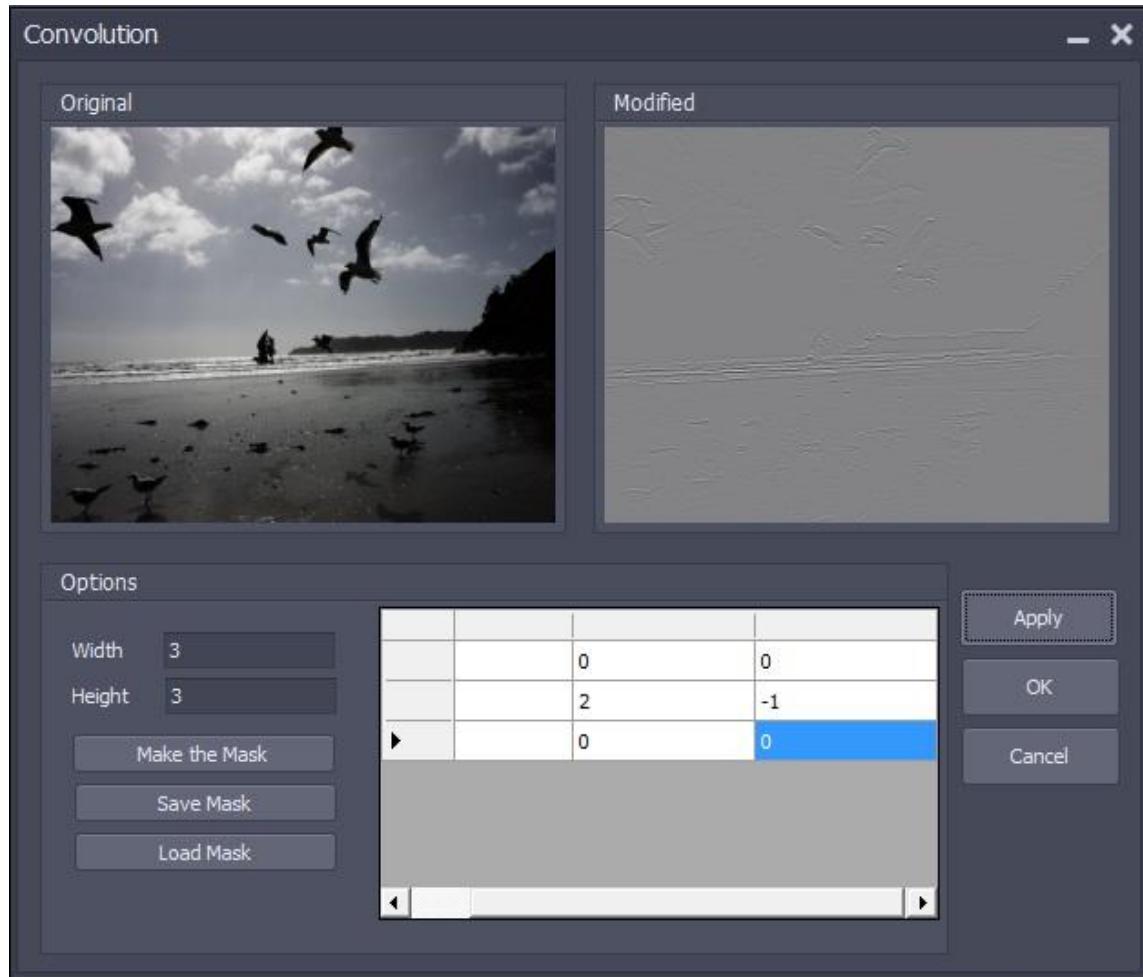


Add salt and pepper noise



## Custom convolution

*Filters → custom convolution → enter width and height then “make mask” OR load a pre-saved mask → apply*

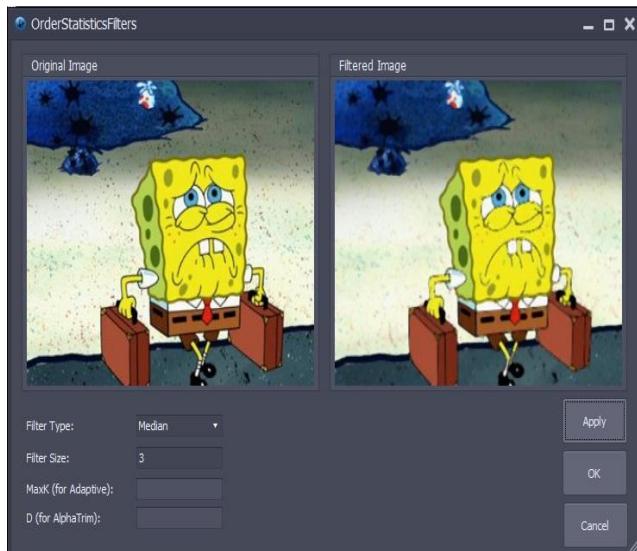


## Remove Noise

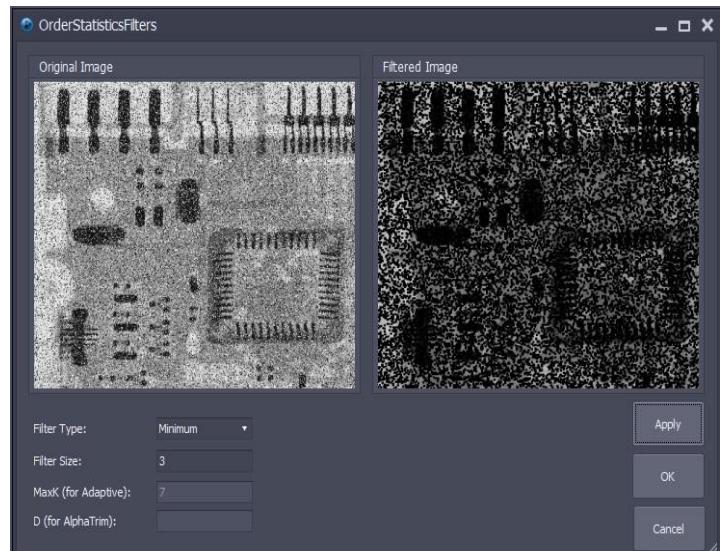
*Filters → remove noise → choose filter type → apply*

Order statistics filters:

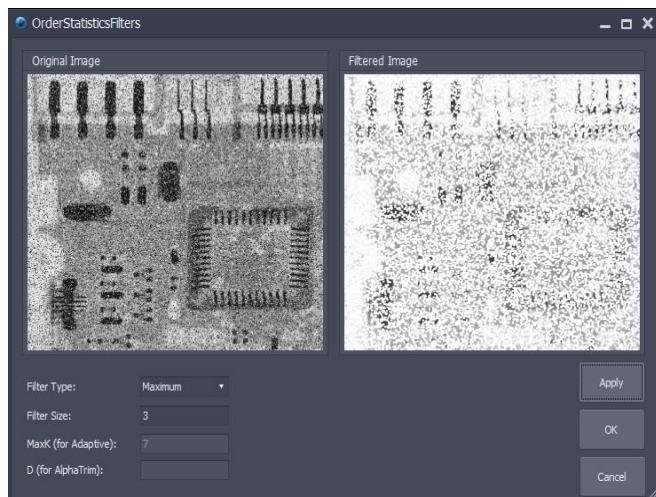
Median filter



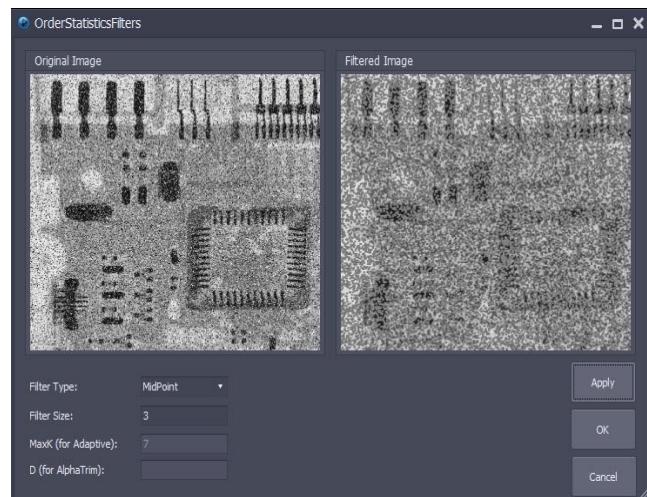
Minimum filter



Maximum filter

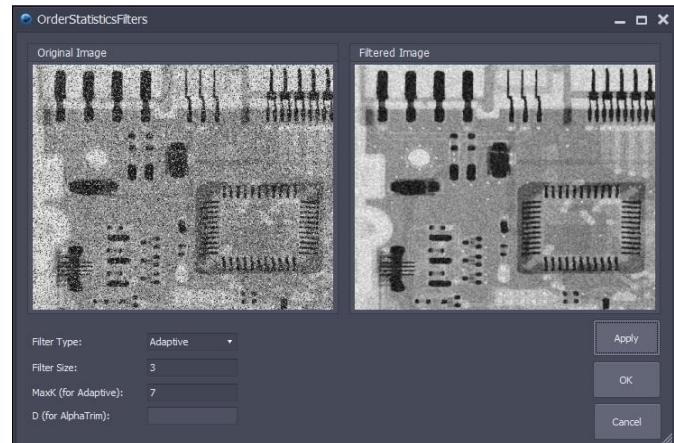


Midpoint filter



## Alphatrim filter

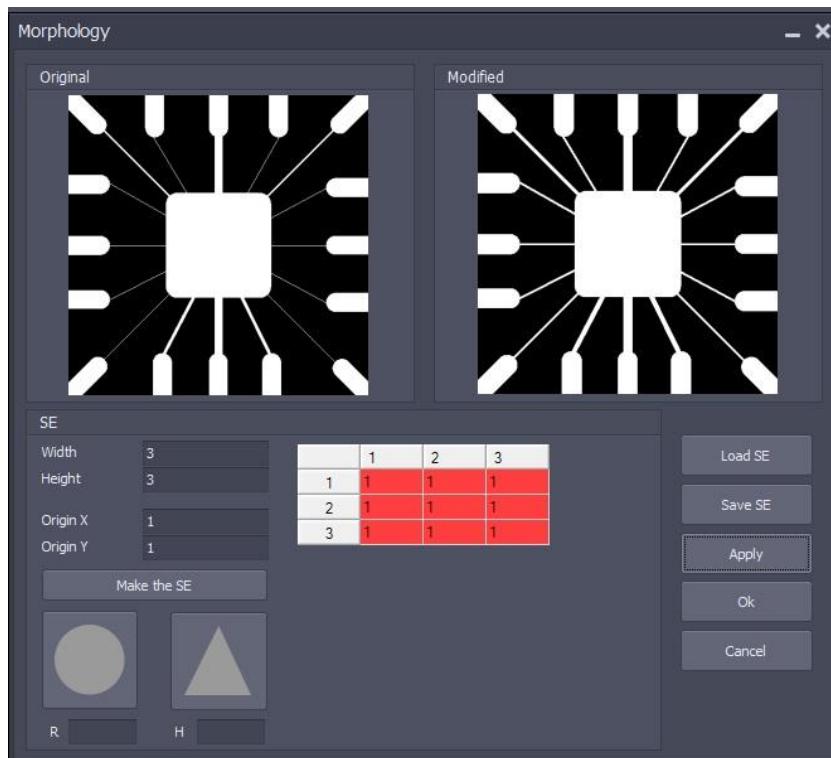
## Adaptive median



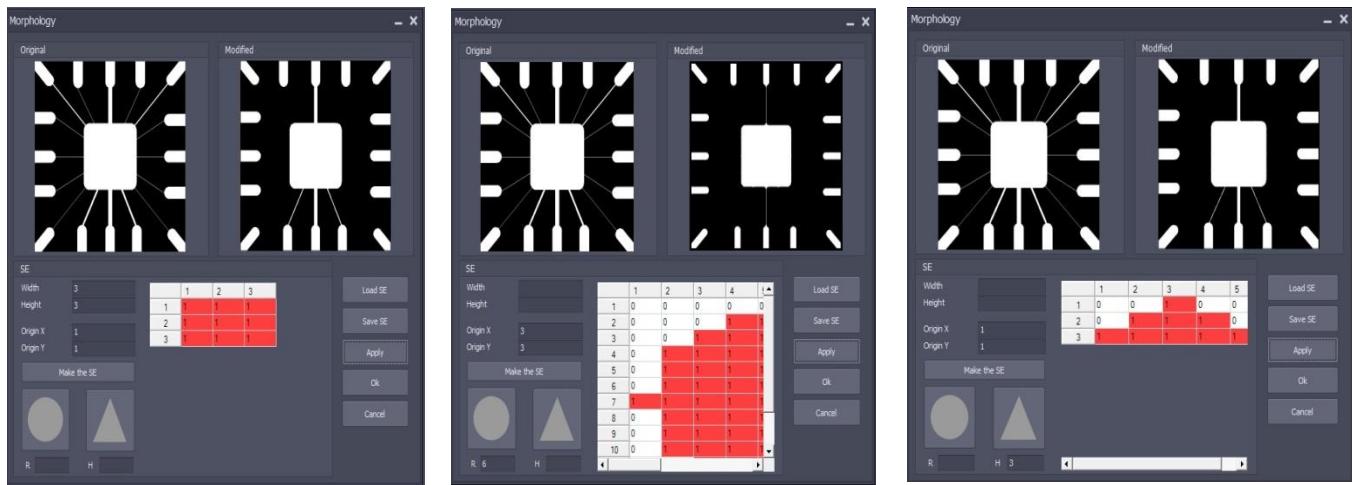
## Morphology Filter

*Filters → morphology → erosion/dilatation → apply*

## Dilatation



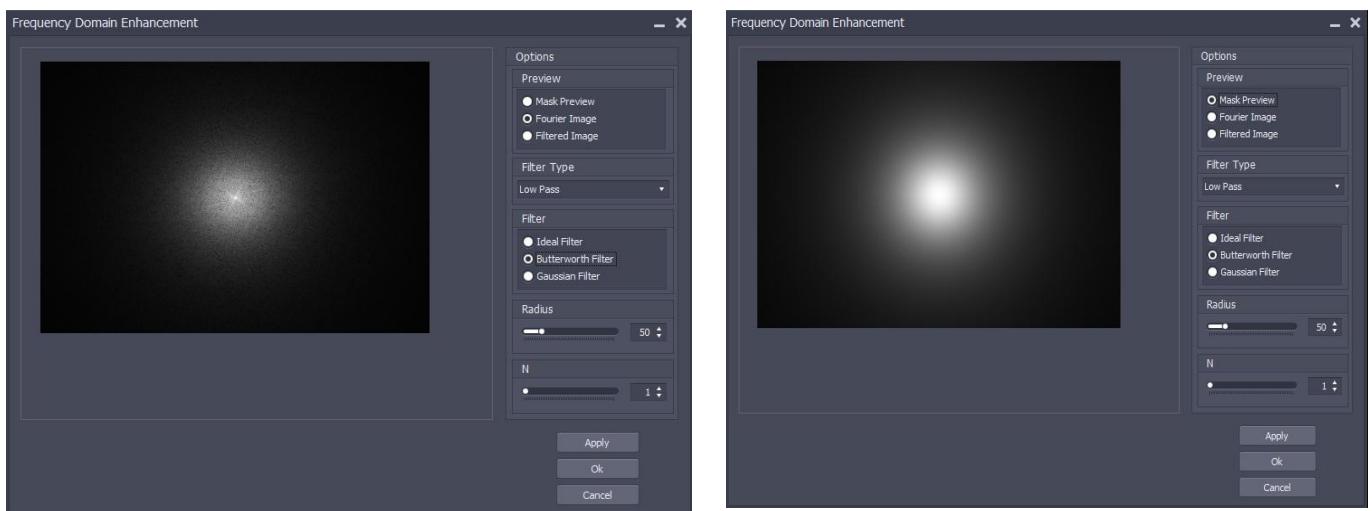
## Erosion



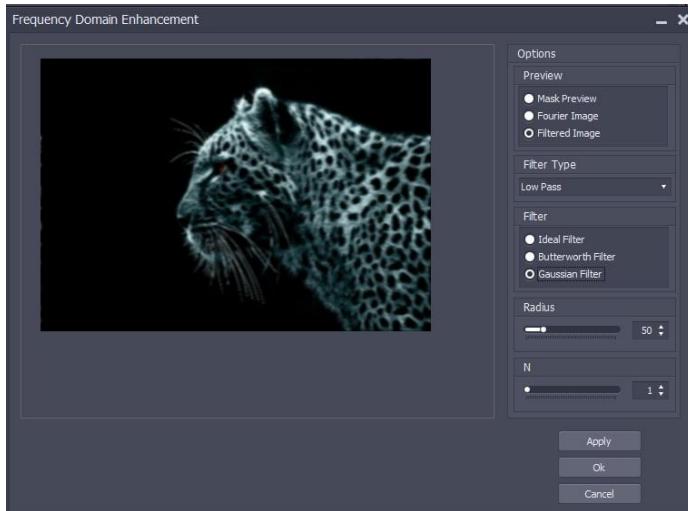
## Frequency Domain Enhancement

## Frequency domain filters

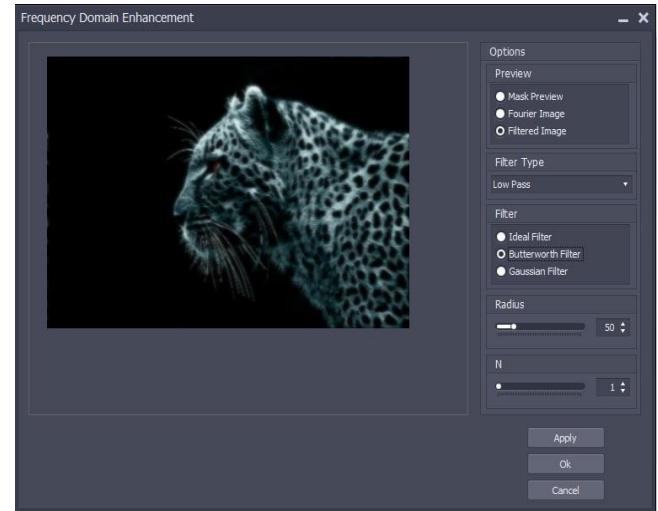
*Fourier* → *Frequency Domain* → select a filter and change its settings → apply



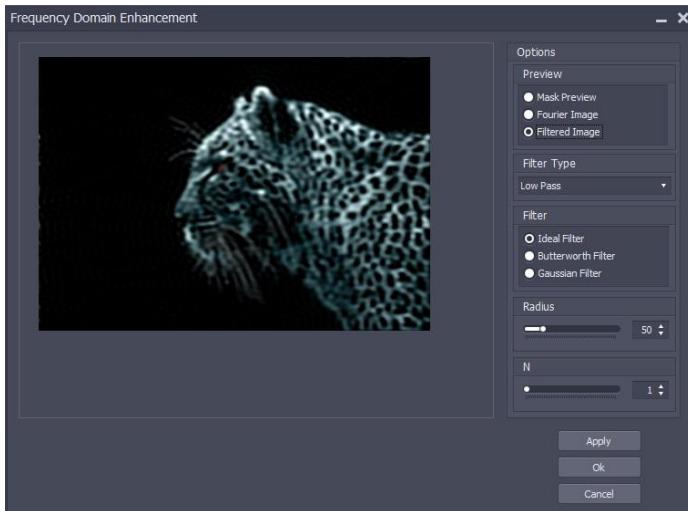
Gaussian Filter



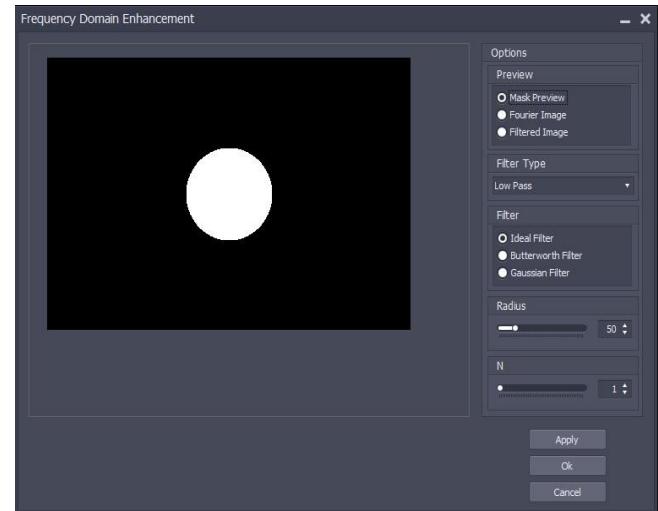
Butterworth Filter



Ideal Filter



Filter preview



## Image Segmentation

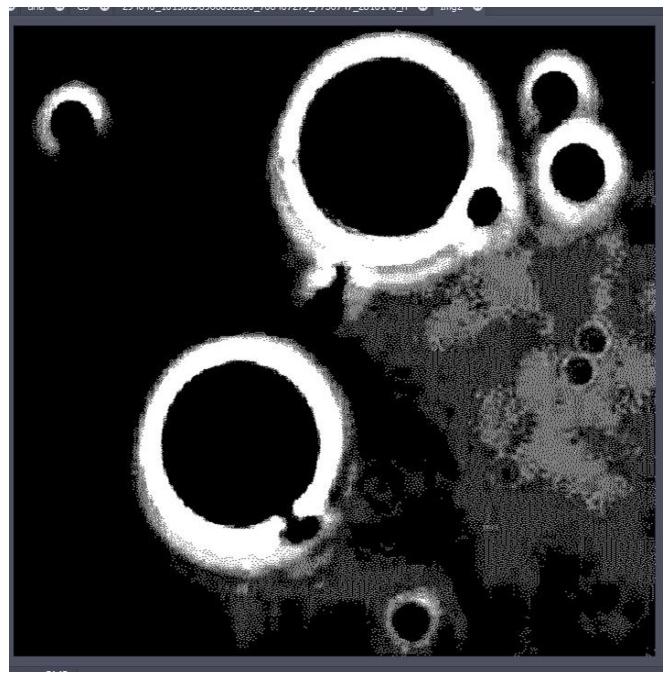
### OTSU Threshold

*Threshold → OTSU*

Original Image



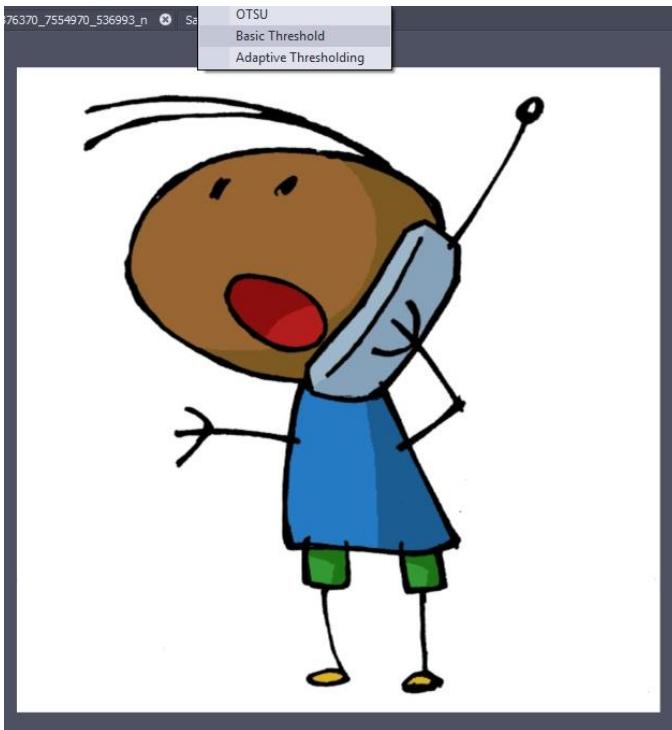
After Applying OTSU Threshold



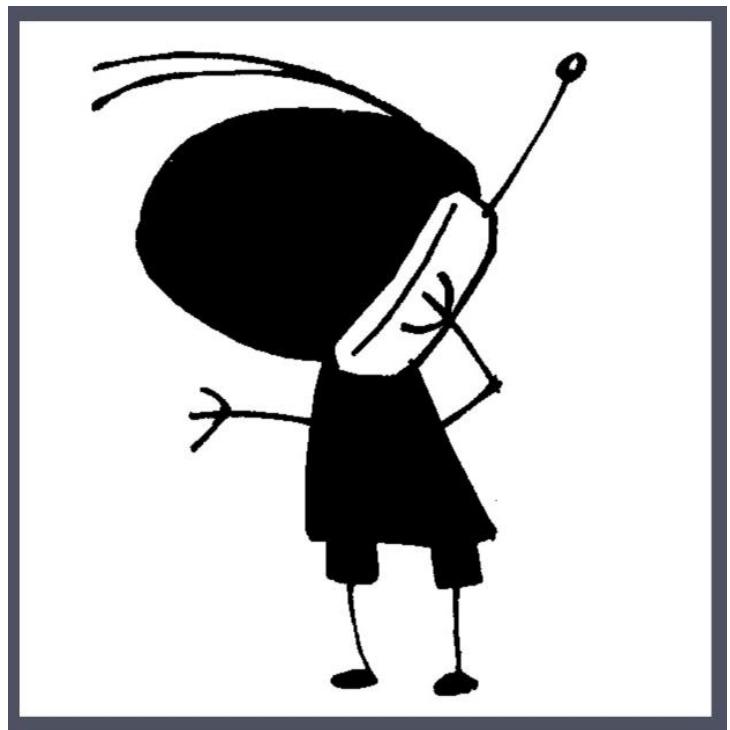
## Basic Threshold

*Threshold → Basic Threshold→enter epsilon value*

Original Image



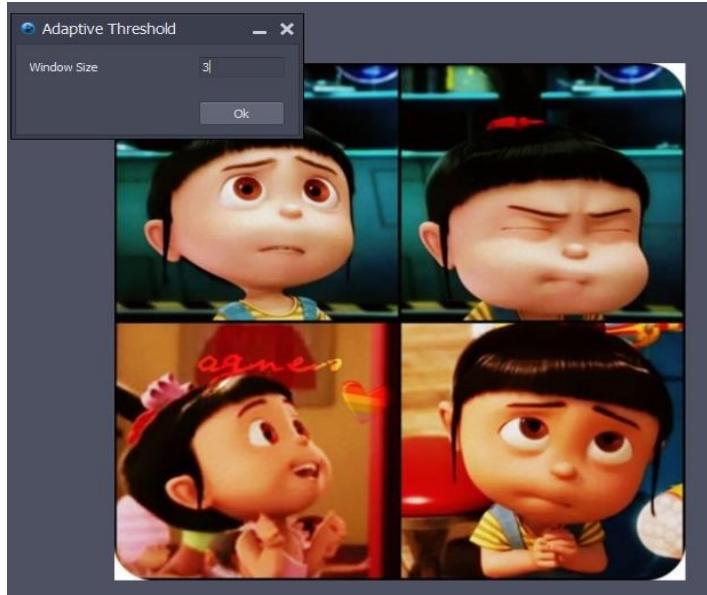
After Applying basic threshold



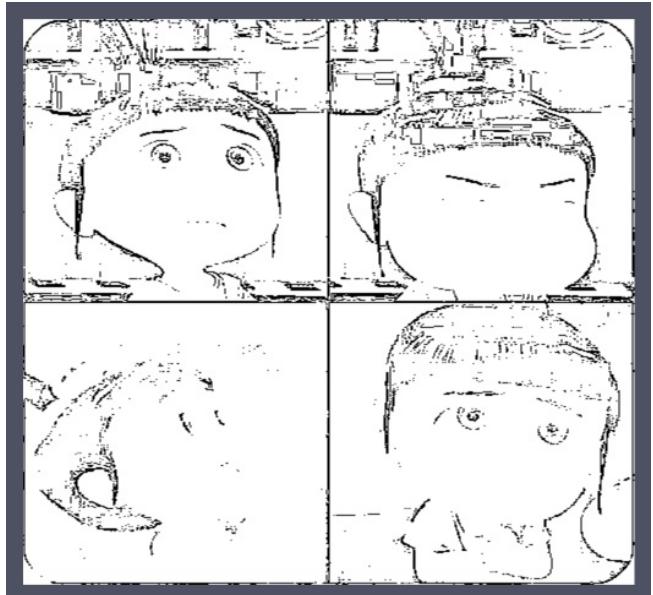
## Adaptive Threshold

*Threshold → Adaptive Threshold → Enter the window size → Apply*

Original Image

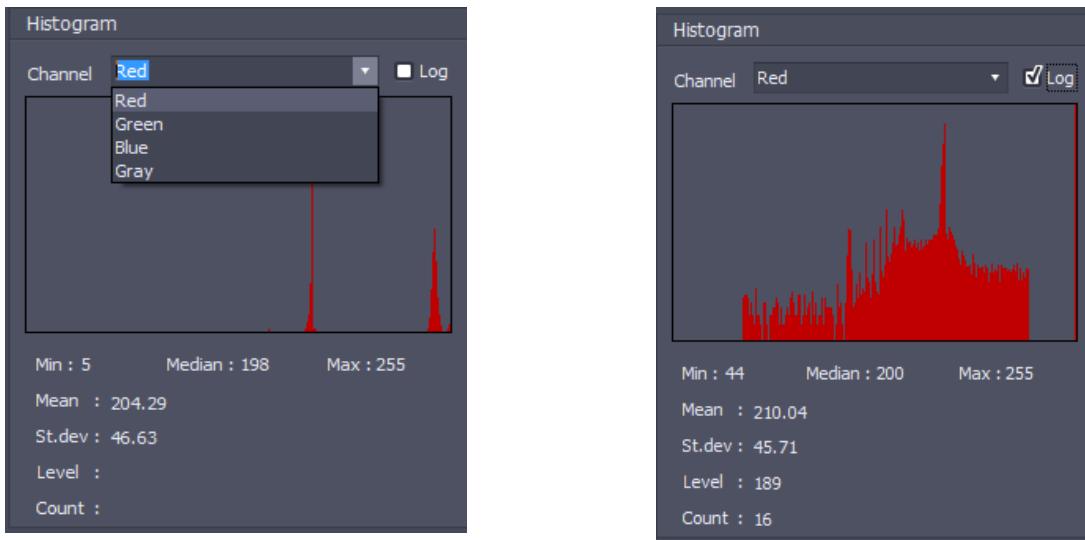


After apply Adaptive Threshold



## Some additional features

## Image histogram & image statistics



## Drag & Drop

You can open a single image or a folder of images by dragging and dropping it into the package main panel.

## History

