Multimedia Application Project Report

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# Introduction

The objective of the project is to develop a small image editor (like GIMP) with C++ language. The final program must be adaptable and a new feature has to be easily to had. In addition to C++ we use the OpenCv library, which is a powerful tool for image processing.

For this project we work on team, each member was in charge of the development of a feature of the program. Our work is centralize on a GitHub repository to be more efficient on the development of the project.

The list of developed functionalities is the following :

* Dilatation / erosion
* Resizing and cropping
* Brightness and contrast
* Panorama
* Canny edge detection

# Main program structure

Our image editor has to be used in command line. When launching the main program, you enter in the menu. You can select from the menu the the tool you want to use. On tool selection, a new window is opened and you can start to editing your image. The user can at any time save the new rendered image by pressing the “s” key.

We decided to put all the tools in different function to make the code more readable.

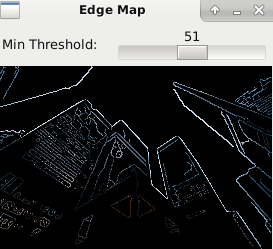
# Features:

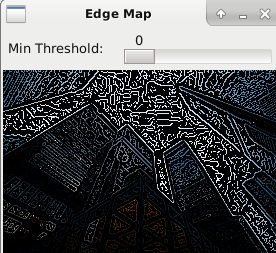
## Canny edge detection

This tool is used to detect the edge of an image. When the tool is selected, you can set the minimum threshold value. If the threshold value is low, the program will detect more edge, if you put the threshold higher, you detect only the main edge of the image.

**Original image**



****

****

**Image with a low threshold Image with a high threshold**

## Brightness and Contrast

This tool is used to render an image with a different contrast or/and to render a different illumination from the original image. With the sliders, the user can select with precision the value of brightness or contrast wanted.



**Original image**

|  |  |
| --- | --- |
| **Low Brightness** | **High Brightness** |
| **Low Contrast** | **High Contrast** |

## Crop

This tool allows you to select and crop a region of the image by dragging the cursor on the area wanted



**Original**

|  |  |
| --- | --- |
|  |  |

When the user click with the mouse for the first time, it create a new point and a new rectangle. Now the user has to move the mouse and select the deasired area. When the user click again, it create a second point and the final rectangle is created. Now the image is resizied at the wanted area.

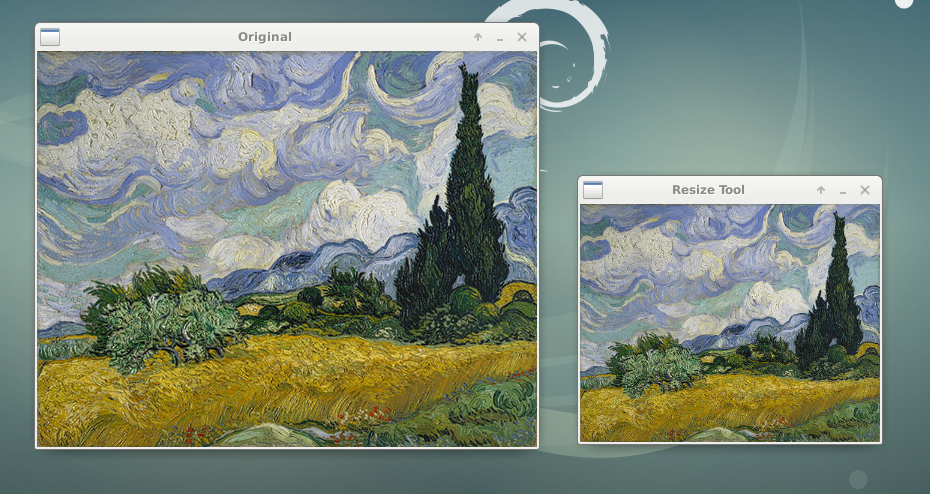
## Erosion

Allow the user to erode or dilate the image. The first track bar allows to choose between the erosion mode or the dilatation mode. Then you can select the shape type between Rectangle, cross or ellipse. Finally you can choose how much the effect is applied to the image with the last track bar.

|  |  |
| --- | --- |
| The original | Image with erosion |

## 5) Resize

With this tool you can modify the proportion and the size of the image. Tio make it easy to use, you can resize your image vertically or horizontally directly with the directionnal arows of the keyboard.



|  |  |
| --- | --- |
|  |  |

## 6) Rotation

The user can rotate the image by adjusting the slider value. Because the rotation can not keep the same ratio, you can also crop the image to avoid the black frame around the image.

|  |  |
| --- | --- |
| Original Image | Rotated Image |