***User Manual***

Image Editor

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**Installation Instructions**

**1. Install Python and PIP**

Find the installer for Python from the official website.

<https://www.python.org/downloads/>

It is recommended you download version 3.12.6, which was used for the development of our software. During installation, ensure the check box to install “PIP” is checked. PIP will allow you to install the necessary libraries for this program directly from the command prompt.

**2. Install the Pillow library using PIP**

In Windows, open the Command Prompt and run the following commands to ensure PIP is updated and install the Pillow library:

py -m pip install --upgrade pip

py -m pip install --upgrade Pillow

Note: The required commands may differ if you are not using windows.

If the above commands do not work, try replacing “py” with “python” or “python3”.

There is another library used by our software called “TKInterface” (“tkinter” for short), but it should be included with the version of Python installed.

**3. Opening the ImageEditor in Python**

Download the source code from our GitHub page.

<https://github.com/Zupe1/image-editor>

The Source Code file should be “ImageEditor\_v#.py”, where # is the version number. “v0\_9” indicates version 0.9, for example.

Double-clicking the downloaded .py file should run the program if Python and the Pillow library are properly installed.

Alternatively, you can right-click on the .py file and select “Edit with IDLE” to open it in Python’s code editor (under “Show more options” in Windows 11), then click on “Run” in the IDLE toolbar and select “Run Module” to run the program. Use this method if any functionality isn’t working properly with the previous method.

**Using the ImageEditor software**

When the software is launched, a blank 500 by 500 pixel image should be created in the main window. The main window has a toolbar along the bottom with buttons for most of the current features. There is also a smaller “brush settings” window.

To create a new image of a different size, click the “New Image” button and input the desired width and height into the input boxes that appear. Create excessively large images at your own risk, as this may cause your computer to take a long time to process operations with the software.

To load an existing image from a file, click the “Load Image” button and use the file explorer to select the desired image file to load.

To draw to the image, you can either click to draw a single pixel, or click and drag to draw a line.

Use the “Select Color” button in the small “brush settings” window to change the color which is drawn to the image when clicking.

Use the “Undo” and “Redo” buttons to revert changes, including creating a new image, loading an image, drawing, and applying filters.

The remaining buttons in the main window’s toolbar apply filters which alter the entire image.

Add Color: This allows you to add and subtract RGB values from the image. Input values for Red, Green, and Blue in the range of -255 to 255. Negative values will cause the color to decrease.

Invert Colors: Inverts the RGB values of the image.

Grayscale: Makes the image grayscale, converting colors to shades of gray.

Black & White: Converts colors to black or white, depending on whichever is closer, without any intermediate shades of gray.

Horizontal Flip: Mirrors the image so that the left and right sides are swapped.

Vertical Flip: Mirrors the image so that the top and the bottom sides are swapped.

Blur: Applies a simple averaging blur from the adjacent pixels for each pixel. You may need to apply this multiple times for a noticeable difference.

Sharpen: Uses a similar process to the blur filter to make each pixel dissimilar to the pixels adjacent to it. You may need to apply this multiple times for a noticeable difference. This filter may not currently work exactly as intended.

Quantize: Rounds RGB values down to the nearest multiple of the “step” value given. If the step value is 255 (the maximum), each RGB value output can only be 0 or 255. Low step values may not produce a noticeable difference.

Invert Value: Converts RGB values to HSV (Hue, Saturation, Value) values and inverts the “value” (the brightness) of the image without changing the hue. This may or may not be working as intended, as dark spots tend to become odd blocks of color, though this could be the result of preexisting image compression.