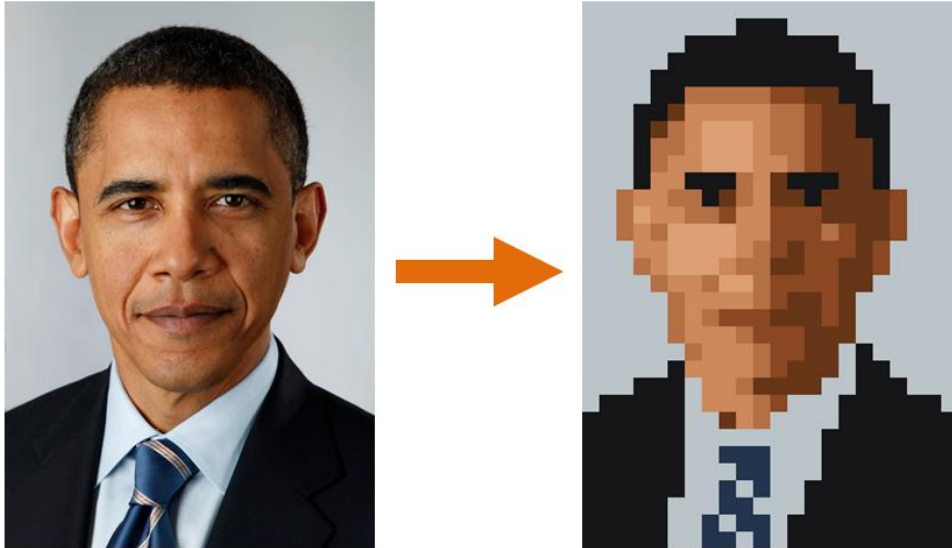


## Introduction

The following guide is to help you get started with our interface and created pixelated versions of your images. This interface uses the algorithm outlined in the *Pixelated Abstraction* Master's thesis and related publications.



## Overview

The general steps to creating a final piece:

1. **Create:** start a New Project
2. **Weight:** (Optional) Using a brush, indicate which parts of the input image are important and which are unimportant.
3. **Process:** Use the automated algorithm to create a result
4. **Edit:** (Optional) Use the built in tools to change the palette and pixels of the result.
5. **Save:** Save your project or export it as an image

Steps 3 (*process*) and 4 (*edit*) can be alternated between any number of times. At any point while *editing*, you can click *process* to have our algorithm find a solution based off your changes. Afterwards, you are free to continue adding your own changes.

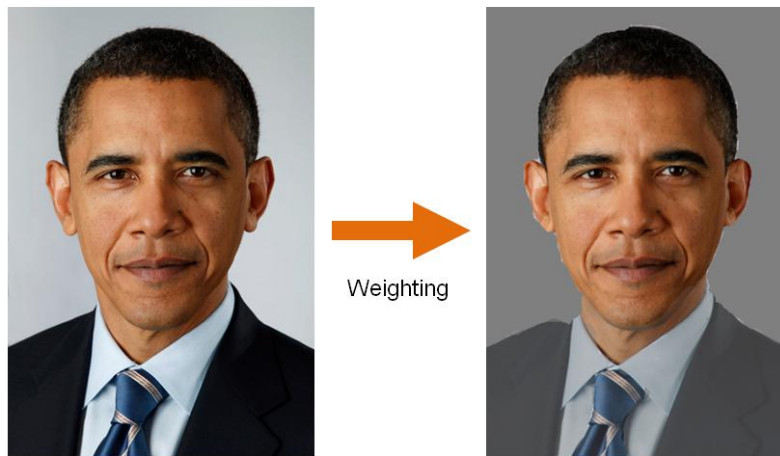
### 1 Create

To begin, choose either *New Project*, or *Load Project*:

- **New Project:** Create a project from a source image. At any point before *processing*, you can select the desired output spatial and palette sizes.
- **Load Project:** Load an existing project saved from a previous session

## 2 Weight (Optional)

Use the weight brush to mark which parts of the image are important (weight = 1) and unimportant (weight = 0) or anywhere in between. Areas painted as unimportant (weight = 0) will be shown as gray and an areas painted as important (weight = 1) will be shown unchanged. Weights in between will be shown with a transparent grey proportional to the weight value. The *processing* step will use this information to determine which colors should be emphasized in the palette.



The controls for the brush are:

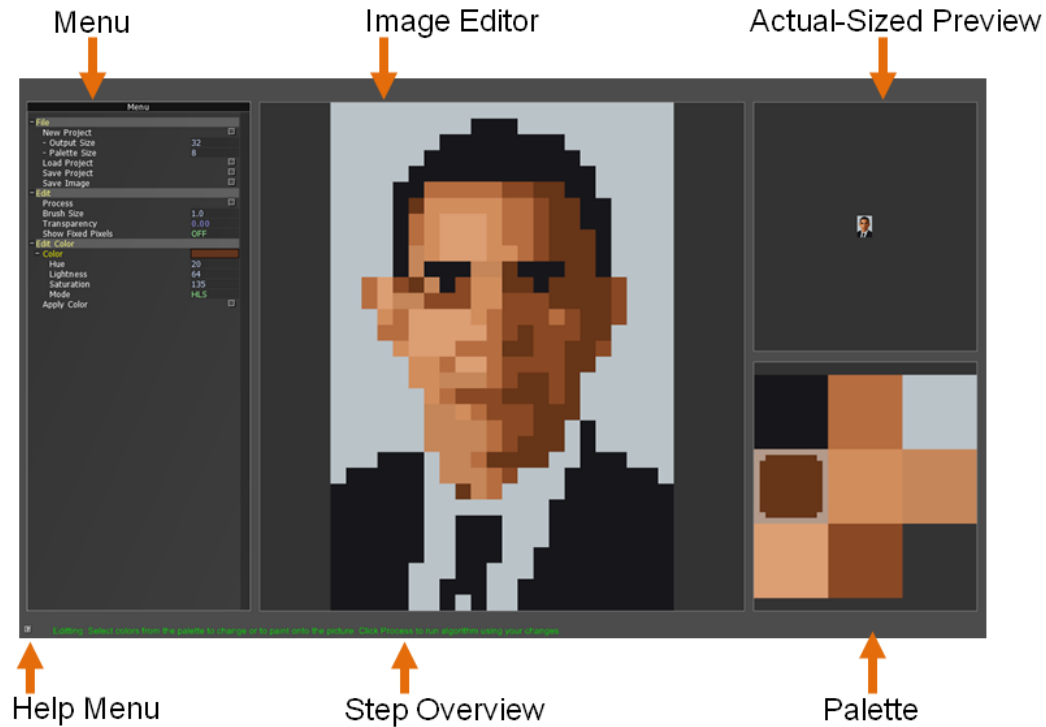
- **Paint:** Left Mouse Button
- **brush size:** Mouse Scroll
- **brush weight:** Shift + Mouse Scroll

The brush properties can also be controlled using the menu on the left of the interface.

## 3 Process

When you are done *weighting* the image and have selected the spatial and palette sizes of the output, the next is to *process* the image using the automated algorithm. The algorithm will find which regions to map to pixels in the output, and which colors to use. This will generally take a moment. After the initial result is found, any future use of this tool on the image will generally take only a second or two.

## 4 Edit



After the initial *processing*, you can make your own changes to the result. We've provided several tools to help make this step easier for you:

**Paint Brush:** Like a typical brush tool, using our paint brush, you can change which colors in the palette pixels map to. Simply choose a color in the palette (by left clicking) and then left click anywhere on the image. However, unlike a typical brush, you can choose more than one color in the palette. To select multiple colors in the palette, hold shift as you click each one. When you paint onto the image, our program will choose the color to assign to each pixel from the ones you've selected. You can remove your changes by right clicking as you paint.

The controls for the brush are:

- **Paint:** Left Mouse Button
- **“Unpaint”:** Right Mouse Button
- **Brush size:** Mouse Scroll

**Color Edit:** There are two ways you can change the colors in the palette

1. After selecting a single color in the palette, use the “Edit Color” menu, to choose a new color, then click “Apply Color” to change the color in the palette.



2. When holding down the Alt key, you will see a set of colors our algorithm has found to be representative of the original image. To change a color in the palette to one of these representative colors, select the color in the palette, and then use the mouse to click on the corresponding representative color while holding the Alt key down.

Note that when you change a color in the palette, the program will determine where this color would be best used in the image. If this color is far from the colors of the original image, it may not be used. However, you can force pixels to that color by simply painting it to where you'd like to see it.

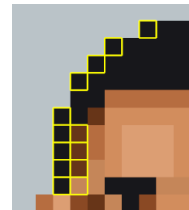
**Transparency:** Found on the menu, this will allow you to see the original image overlaid on top of the pixel image. This will allow you to compare the result with the original image. You can also hold the spacebar down to see the original image, without overlaying it.

**Reset:** At any time you can reset the image to before the initial *processing*. This will erase all of your current progress, except any weights you have previously provided. To also remove the weights, press the reset button a second time while in the weighting step.

## 4.5 Reprocessing

Anytime while *editing*, you can re-process the image (simply click the *process* button again). This will run our algorithm on the current image, using your input to better educate the result. You can affect this step in two ways:

**Fixed Pixels:** Every time you paint on the result, our program is keeping track of which pixels you changed. You can view which pixels are fixed by using the “Show Fixed Pixels” menu item. When *processing*, these pixels will not change from the color(s) you assigned them to. If you'd like to “free” any of these pixels, simply paint over them by holding down the Right Mouse Button.



**Fixed Colors:** You may have noticed every time you changed a color in the palette, a Lock symbol appeared over the color. This means that during the *processing* step, this color cannot change. To “lock” or “unlock” these colors, simply click them using the Right Mouse Button.



After *reprocessing*, the program will switch back to *edit* mode, where you are free to make more changes, *process* again, etc.

## 5 Save

When you are done working on your image, you can save the project using the *Save Project* button. You can later load the project back up later, and continue from where you left off. If you'd like export your result as an image, use the *Save Image* button.

## Advanced Options

There are some advanced options of the automated algorithm. These are for users who would like to fine-tune the algorithm or for readers of the paper, and are not necessary for typical use. Here is a brief summary of what each option does:

- **SLIC Factor:** When *processing*, the importance of pixel location vs. pixel color when creating regions to map to pixels in the output. The higher the value, the more important the pixel location becomes.
- **Saturation:** The amount of extra saturation used to create the output palette. 1.0 corresponds to no extra saturation, 1.1 corresponds to 10% extra saturation.
- **Smooth Factor:** During processing, the higher the smooth factor, the more regions try to retain their original neighborhoods.
- **Color STD:** The standard deviation used for the color component in the algorithm's bilateral filter. The bilateral filter is used to smooth noisy regions of the input image.
- **Position STD:** The standard deviation used for the positional component in the algorithm's bilateral filter. The bilateral filter is used to smooth noisy regions of the input image.