README for imageComparator.py

Requirements:

- Python 3.x
- cv2 (OpenCV 3) library for Python installed
- ImageMagick installed

Usage:

- *python3 imageComparater.py* **(For Ubuntu)**
- *python imageComparater.py* **(For Windows)**

Installing ImageMagick is very simple.

On Ubuntu systems, to install ImageMagick, type the following command in terminal:

sudo apt-get install imagemagick

For Windows, go to the following link:

https://www.imagemagick.org/script/binary-releases.php

And head to Windows Binary Releases, to download the version you want.

OpenCV installation for python is a complex process and is best explained in the following link:

http://www.pyimagesearch.com/2016/10/24/ubuntu-16-04-how-to-install-opencv/

(for Ubuntu)

https://www.solarianprogrammer.com/2016/09/17/install-opencv-3-with-python-3-on-windows/ (For Windows)

ALGORITHM EXPLANATION:

For Layer files (JPG files):

- Apply Close Morphology -> Median Filtering -> Smoothing and Binarization -> Trimming

For Mask Files (SVG files):

- Remove transparency, change background to white, foreground to black -> Median Filtering -> Smoothing and Binarization -> Trimming

The trimming files produced in each of the above algorithms are of different sizes (dimensions).

After both the above algorithms are completed, we resize the final trimmed layer files to the size of the mask files (because they have smaller resolution). After resizing, we calculate histograms of each of the trimmed files (4 files) which contains the intensity distribution of each pixel in the trimmed image.

Once the histograms are calculated, they are compared using the BHATTACHARYYA Histogram Comparison Methodology. The score on comparison ranges from 0 (exact match) to 1 (complete mismatch). After we get the score, subtract it from one and multiply by 100 to get the percentage. This percentage shows how much area of the hollow shape that we started with initially, can be filled by the black solid image given, which is not complete and contained noise as well.

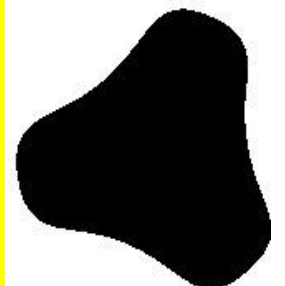The above algorithms shown step by step:
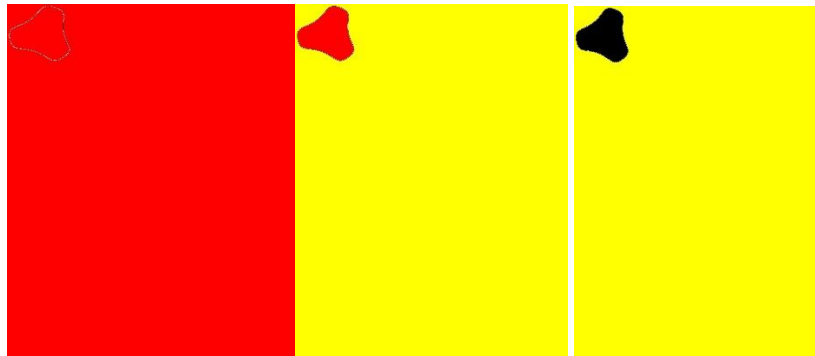
Layer files algorithm:
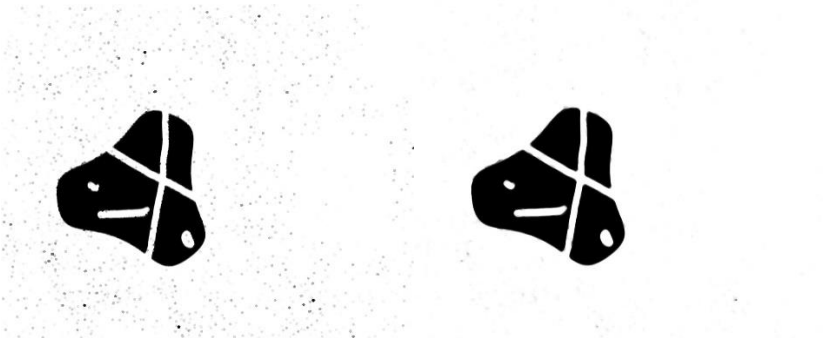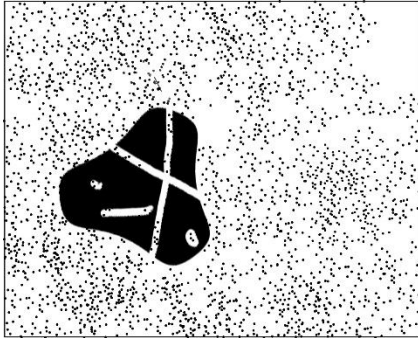
(All Noise removed)   (trim waste space)

Mask Files algorithm:

Original SVG   ------ Making Background white and shape black ----   Trimmed Image