Part 1:

Photo2ClipArt

Image Abstraction and Vectorization Using Layered Linear Gradients

Part 1: Talon Baker

This explanation is based on a paper written by JEAN-DOMINIQUE FAVREAU, FLORENT LAFARGE, and ADRIEN BOUSSEAU from the Université Côte d'Azur, Inria and can be found in the ACM Transactions on Graphics (TOG) - Proceedings of ACM SIGGRAPH Asia, Volume 36 Issue 6, November 2017

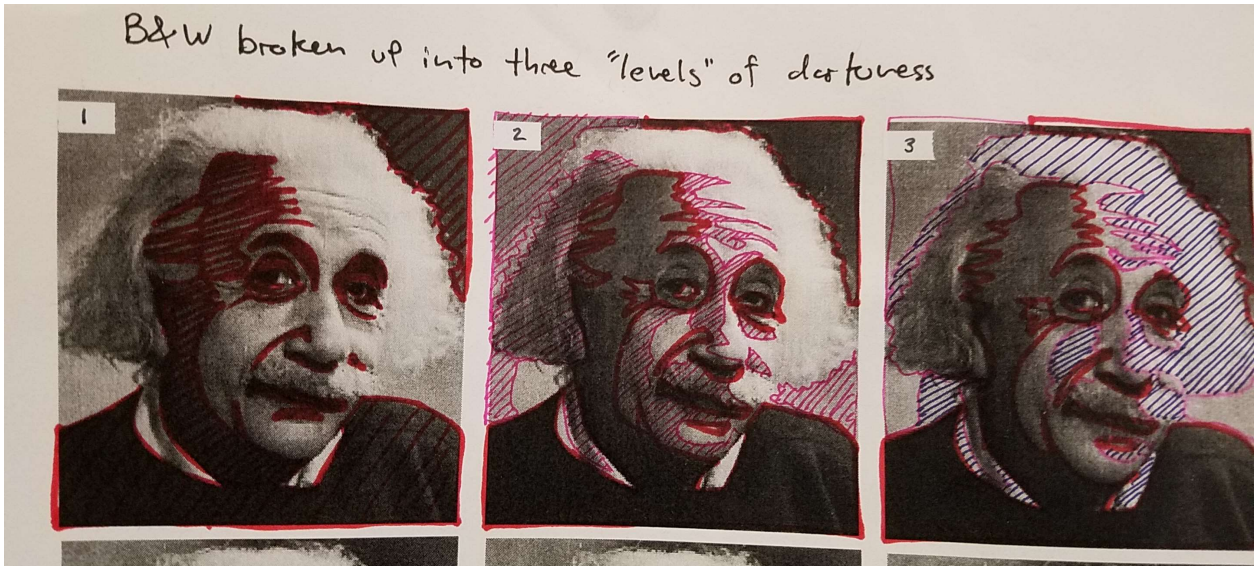
This paper details the math and techniques behind creating a clipart-like image from a real photo. Below, to the left, is a photo of a ladybug and to the right is a clipart-like representation of that ladybug in its colors, parts, and components.

I will explain at a high level my understanding of this process and how it might be replicated using GLSL shaders and THREE js in a much more simplified form using the following steps:

→ Note: This is not the technique used in the paper, it's just my interpretation to GLSL

1. The image can be passed in as a texture to the Fragment Shader (the vertex shader is not needed for this project). This is done so the image can searched and it's R, G, B, and A values can be used.
2. The image can be broken down into its primary colors one pass at a time:
    a. First, the colors most closely related to **black** will be scanned and passed into a buffer, like the way we programmed the Game of Life in the shader.

b. This process will repeat itself for every color, within a range of colors. For example, I will search between black (0, 0, 0) and red (1, 0, 0) and any color that I find in that range will be saved as a texture image. Then I will search between red (1, 0, 0) and green (0, 1, 0) and save those colors as an image. I will repeat this process over and over for as many color ranges I want or until I get the number of “clips” for the clipart-like image that I want



3. Above is a picture of Einstein that I colored, broken up into levels of black and white, each taken from the image and overlaid into a new image that creates one combined image that is very clipart-like.

This might not work out too well, but that is my idea on how a GLSL shader can take an image like Einstein can create a clipart-like image from it.

Part 2:

I have been trying to get in contact with another student / students to group up with for the final project. So far everyone I talk to is either in a group already or has too many people to add me into their group.

I will continue searching for a group but I will also post a Slack message about anyone still searching for a group to be a part of.