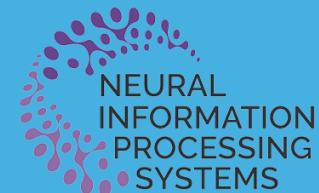


Stroke Patches

Customizable Artistic Styling Using Regression

Ian Jaffray

John Bronskill



Artistic Styling

Transform an image or video so that it appears to be hand painted or sketched.



Computer Graphics, Volume 24, Number 4, August 1990

Paint By Numbers: Abstract Image Representations

Paul Haeberli

Silicon Graphics Computer Systems

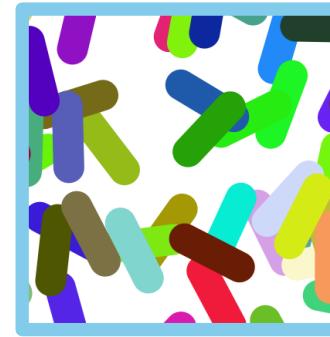
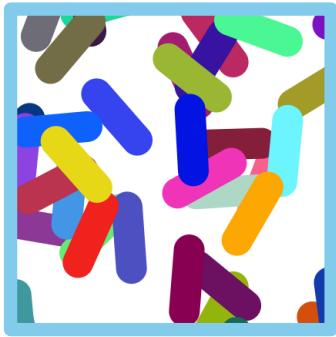
A Neural Algorithm of Artistic Style

Leon A. Gatys,^{1,2,3*} Alexander S. Ecker,^{1,2,4,5} Matthias Bethge^{1,2,4}



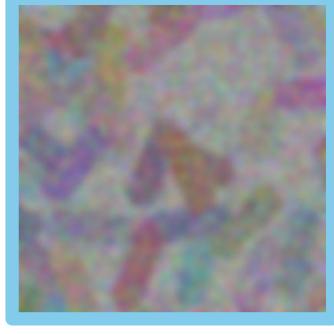
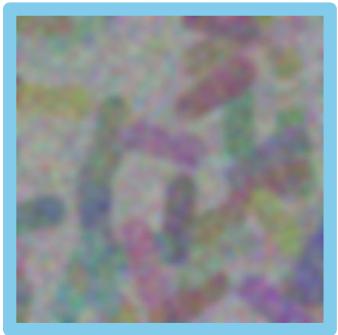
How It Works

1. Generate Stroke Patches

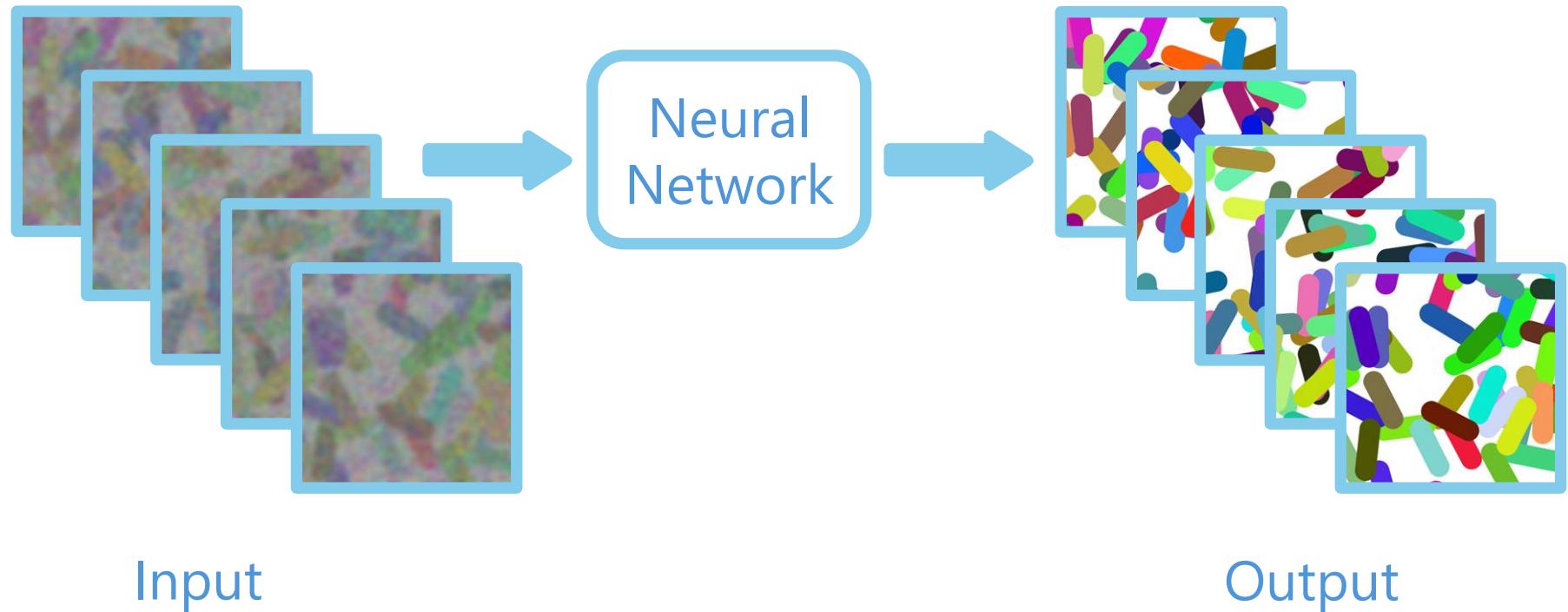


Simple shapes at random sizes, orientations, colors, and opacity.

2. Add Noise and Blur

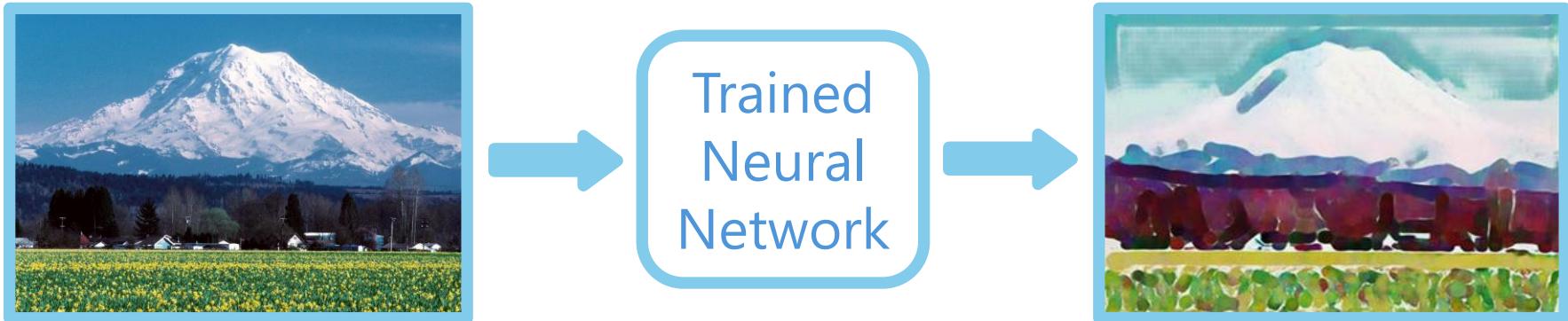


3. Learn a Neural Network

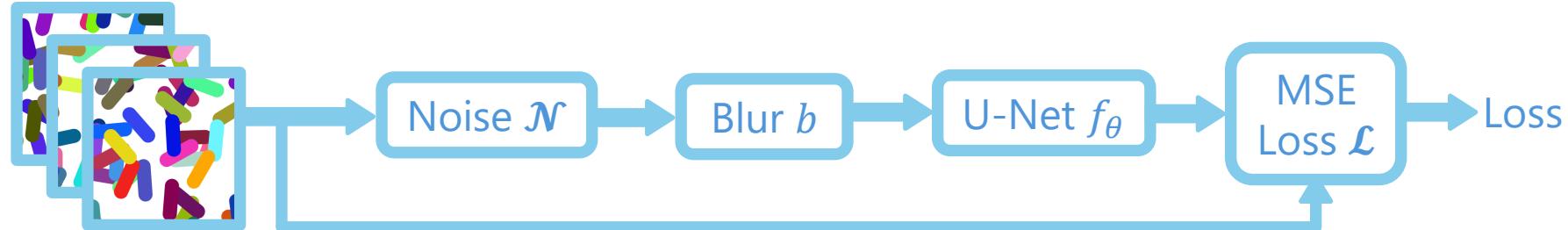


Train a network to map the blurry, noisy strokes to clean ones.

4. Transform Any Image into Art



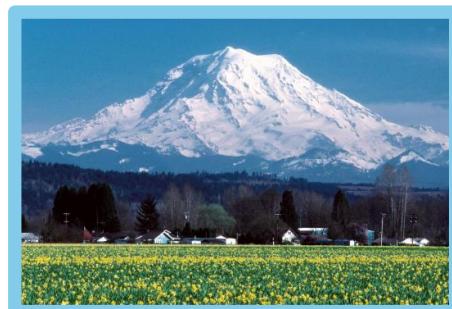
Training



Stroke Patch Set
 $P = \{p_1, p_2, \dots, p_N\}$

$$\mathcal{L}(\theta) = \frac{1}{N} \sum_{i=1}^N (f_\theta(b(p_i + \mathcal{N})) - p_i)^2$$

Inference



Input Image x



$$y = f_\theta(x)$$



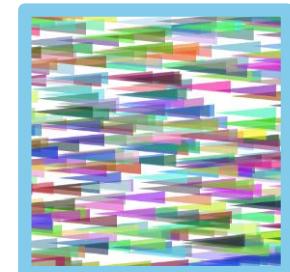
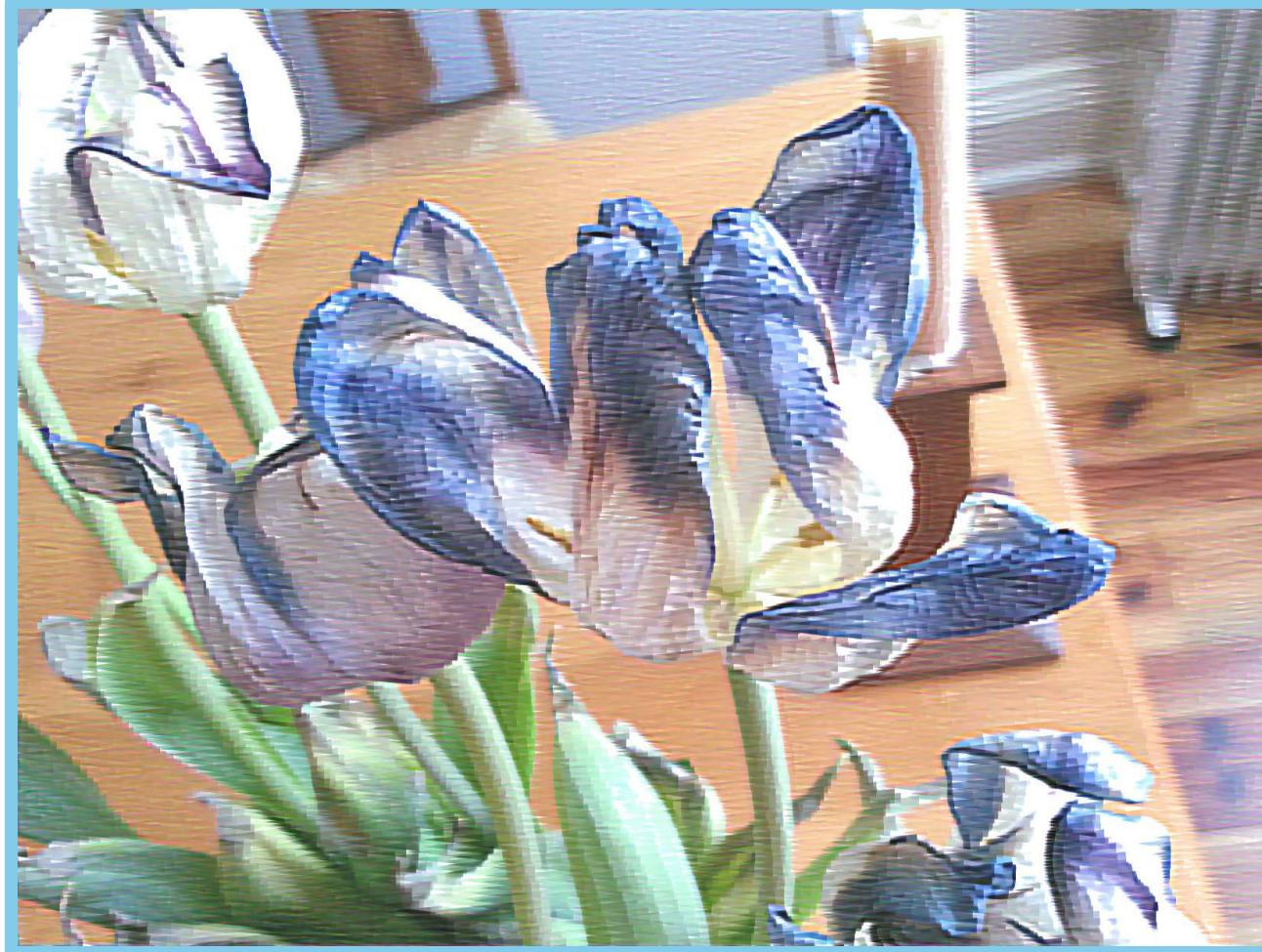
Styled Image y

Advantages

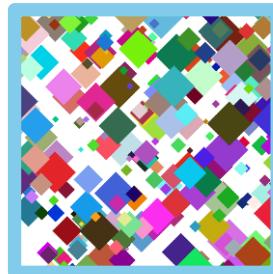
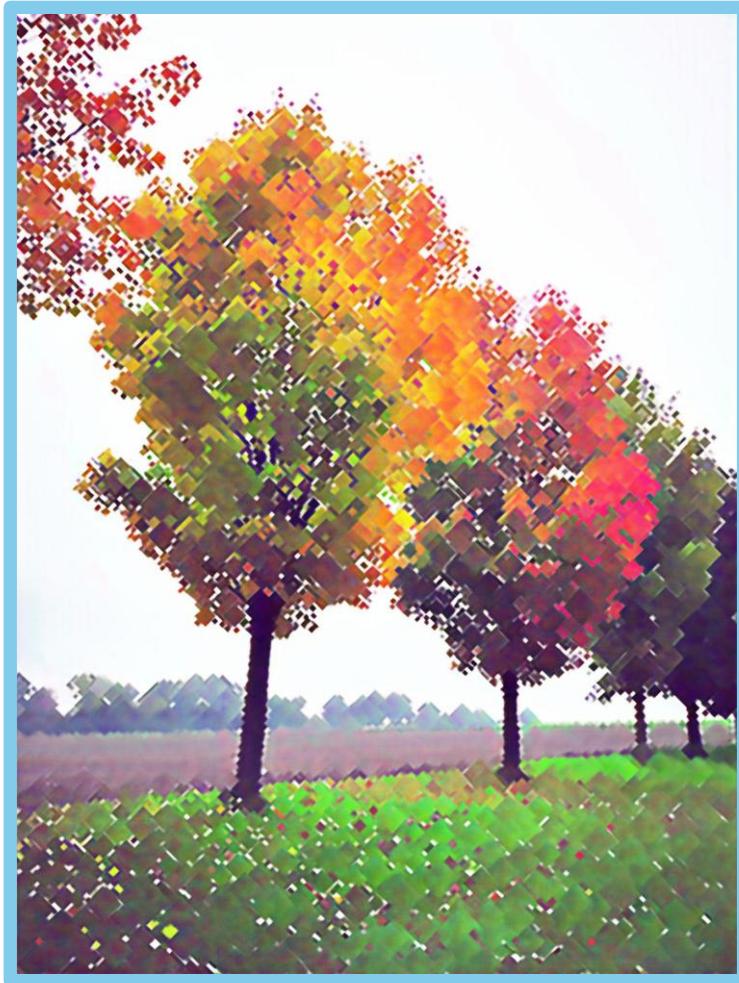
- Allows for explicit and extensible control over image detail via stroke patches.
- Can be trained on a consumer GPU with 12 GB of memory in less than 20 minutes.
- Once trained on a stroke patch set, any input image can be styled in less than a second.

Examples

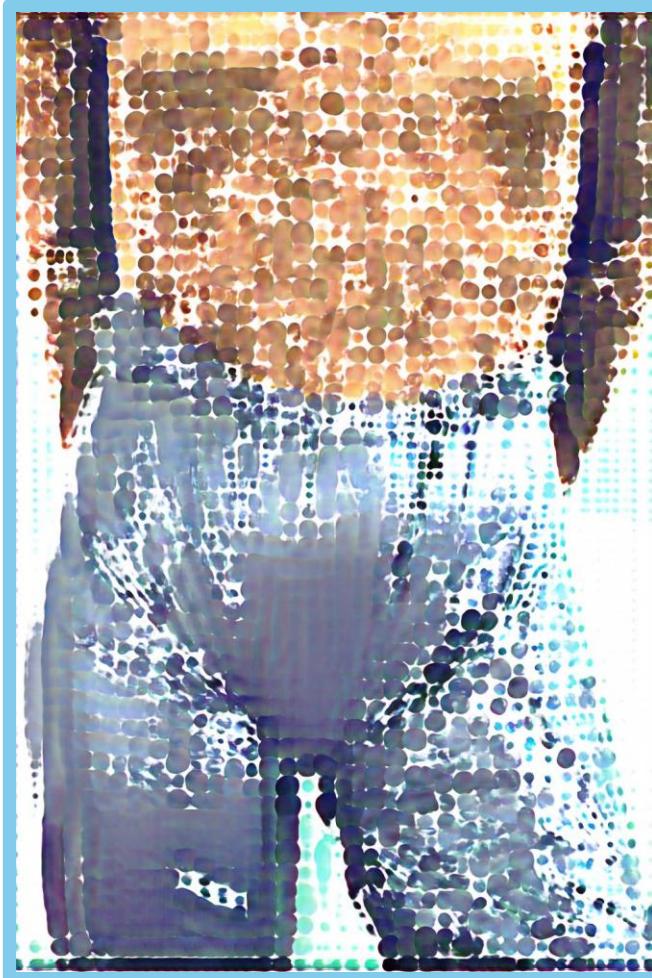
Cuneiform



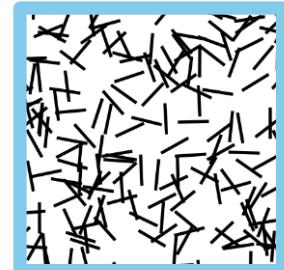
Diamond



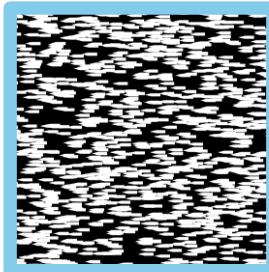
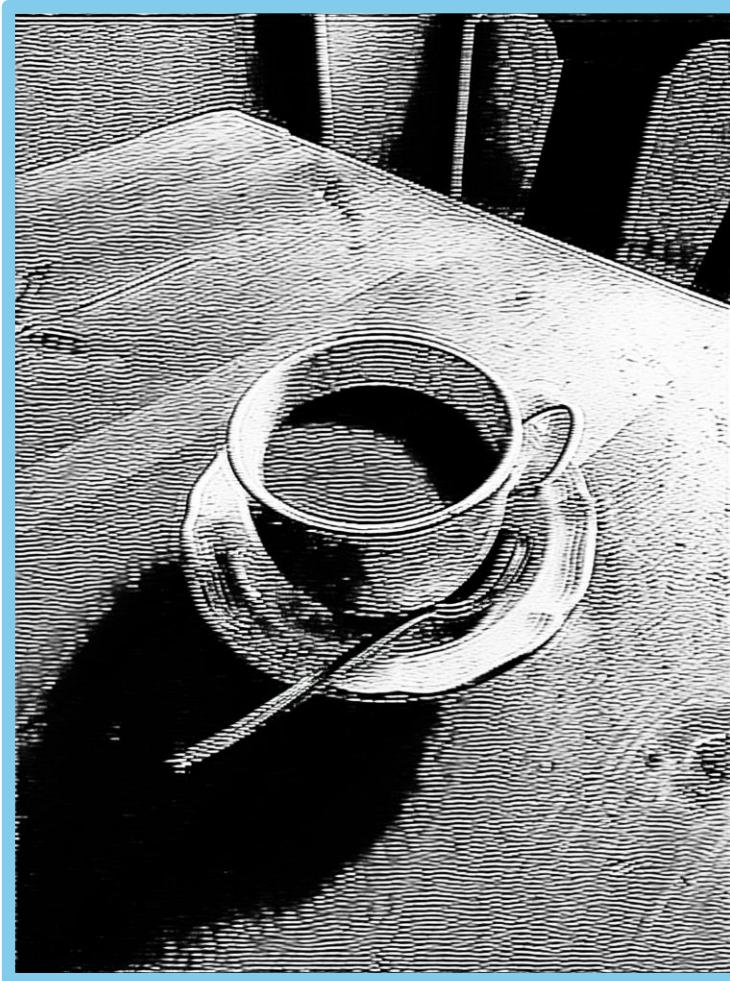
Halftone



Letratape



Lino



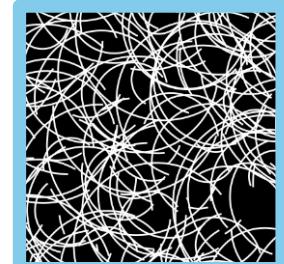
Paper Strip



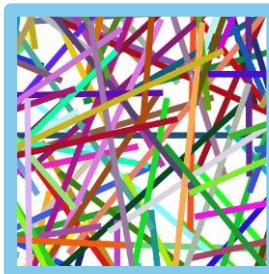
Rough



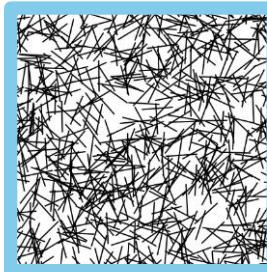
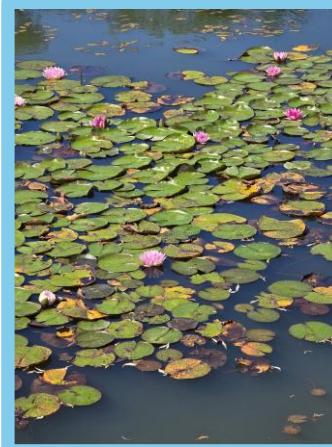
Scratchboard



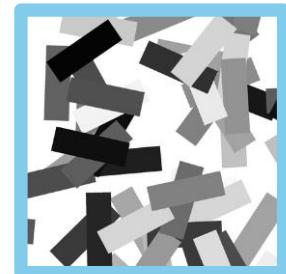
Scribble



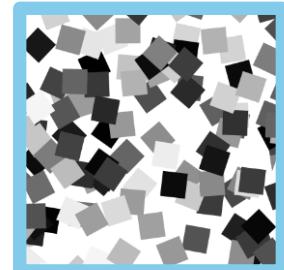
Silverpoint Rough



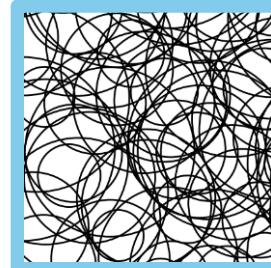
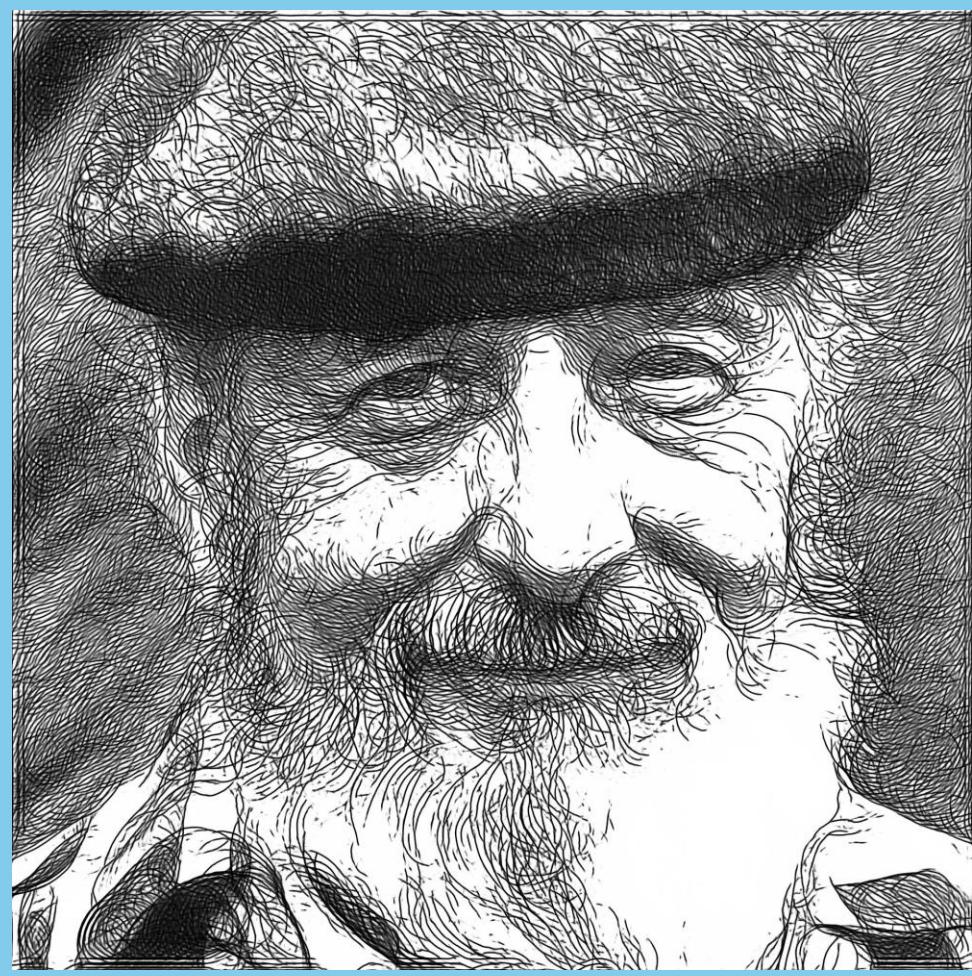
Smooth



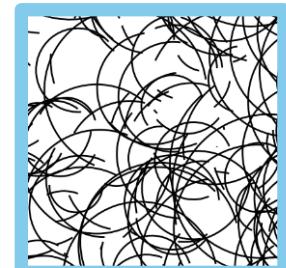
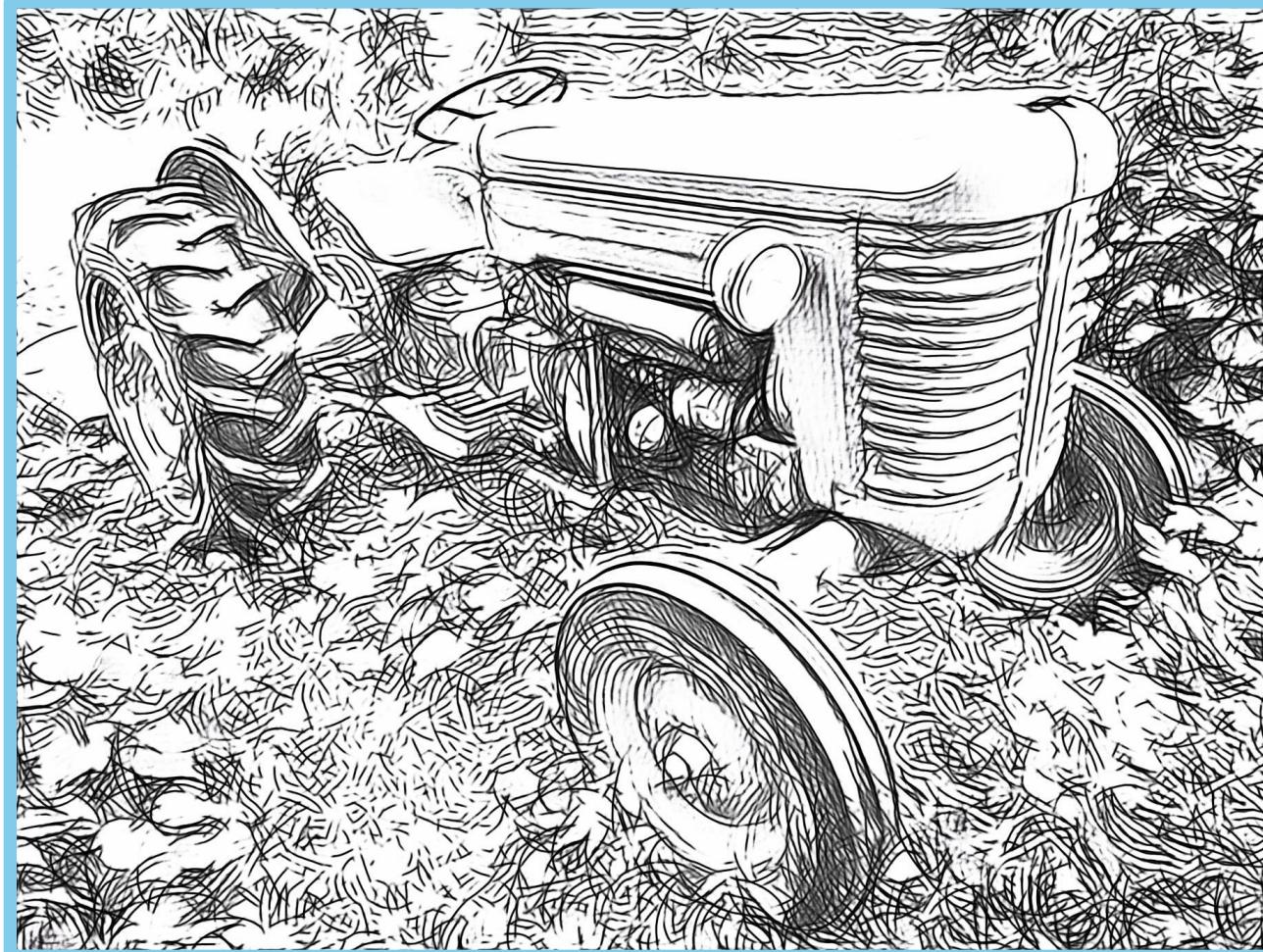
Soft Square



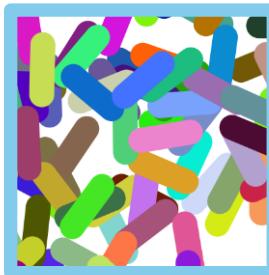
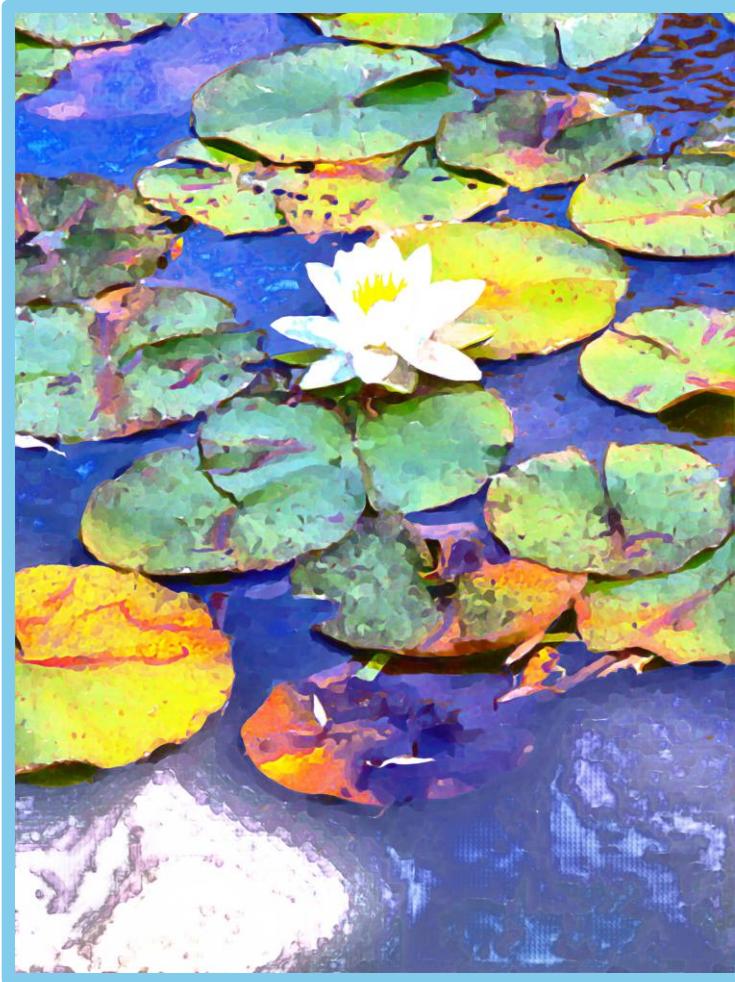
Speedball Cursive



Speedball Regular



Wet Gritty



For more information and code:

https://github.com/jfb54/stroke_patches

