Drawings From Photos

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Goal: Automatically generates non-photorealistic (NPR) digital drawings

Constraint: Highly customizable

Dataset: ‘Labeled Faces in the Wild’
Baseline

Original image -> Canny edge extractor + Color Clustering = Blended drawing
Color Clustering improvement

Cluster color in **LAB space** instead of RGB space

Less ‘bleeding colors’

More vivid colors
Varying Gamma
Varying Cluster Count
Color from Automatic Region Segmentation

Advantage: ‘sharp’ regions with good color preservation
Region Identification with Saliency

- Convert image to LAB color space and compute saliency
  - Identifies regions distinct to the human eye
- Binarize & apply morphological image processing
- Use for applying colormap to linesketch
Line Integral Convolution

- Segment image into regions based on color and connectivity
- Extract vector field by rotating image gradients
- Snap regions with low variance in vector field to their mean vector
- Generate noise image and smear it along streamlines of the vector field
- Vary smear length for longer/shorter strokes

3 pixels 7 pixels
(Almost) Final product

Gather hyperparameters into 2 meaningful axis:

- +/- realistic

$$im_{out} = 1 - (1 - \lambda_r im_{rgb})(1 - (1 - \lambda_r)im_{draw})$$

‘screen’ image blending

- +/- detailed

blending factor for detail from LIC

Your Photo Here

Say cheese!
Future work

Pregenerate LIC images for subsample of images (~5mins per image)

Incorporate more complicated subcomponents into GUI

Different style defaults corresponding to (realism, detail) settings

Evaluate Photo2Drawing with a user preference survey

Compare to similar Photoshop filters