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



Baseline Photo2Drawing pipeline

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





(Almost) Final product

Gather hyperparameters into 2 meaningful axis:

- +/- realistic $im_{out} = 1 (1 \lambda_r i m_{rgb})(1 (1 \lambda_r) i m_{draw})$ 'screen' image blending
 - +/- detailed

blending factor for detail from LIC



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