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Simple Artistic Toolset

Extended Difference of Gaussian

- XDoG: An eXtended difference-of-Gaussians compendium including advanced image stylization
 - Holger Winnemoller, Jan Eric Kyprianidisb, Sven C. Olsen
- Implemented image sharpening and thresholding











Painterly Style

- Painterly rendering with curved brush strokes of multiple sizes
 - A. Hertzmann
- Implemented the entire paper
- Did not get it to run fast enough to apply it to video images
 - There is still room for improvement















Salient Preserving Grayscale

- Robust Color-to-Gray via Nonlinear Global Mapping
 - Yongjin Kim, Cheolhun Jang, Julien Demouth, and Seungyong Lee
- Color2Gray: Salience-Preserving Color Removal
 - Amy A. Gooch, Sven C. Olsen, Jack Tumblin, and Bruce Gooch

Reduce the Range

- Standard Grayscale:
 - $g = 0.299R + 0.587G + 0.114B$
- Modified Grayscale
 - $g = w_1R + w_2G + w_3B$
- Restrict the possible values for w_1, w_2, w_3
 - $w_1 + w_2 + w_3 = 1$
 - $w_1, w_2, w_3 = 0.1k$

Reduce the Number of Pixels

- Resize the image to something that can be analyzed quickly
 - Even with 64x64 images this was still too slow
 - 1,107,296,256 comparisons

Fast Linear Grayscale

- Create a Pool of pixel pairs and use that for the comparisons
 - 64^2 pixel pairs
 - 270,336 comparisons
- Real-time Contrast Preserving Decolorization
 - Lu, Chewu, et al.

















Combined Results













Future Plans

- Build an actual user interface
 - The current command line interface has so many options it's almost unusable
- Speed up the painterly rendering
 - Rewrite it in CUDA over the summer term
- Apply the techniques to video as well

Code

- All current and future code for this project has been pushed to my GitHub repository

<https://github.com/crophix/PhotoManipulator.git>