

Histogram Warping

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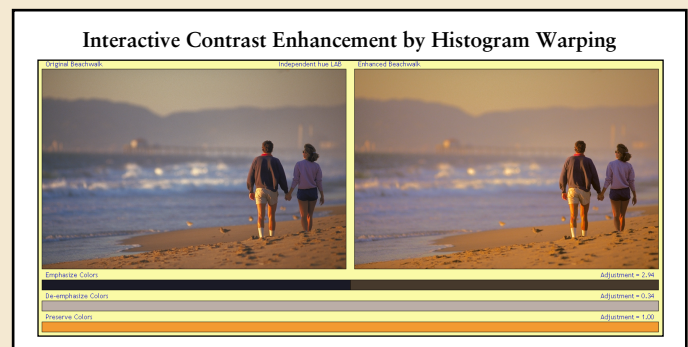
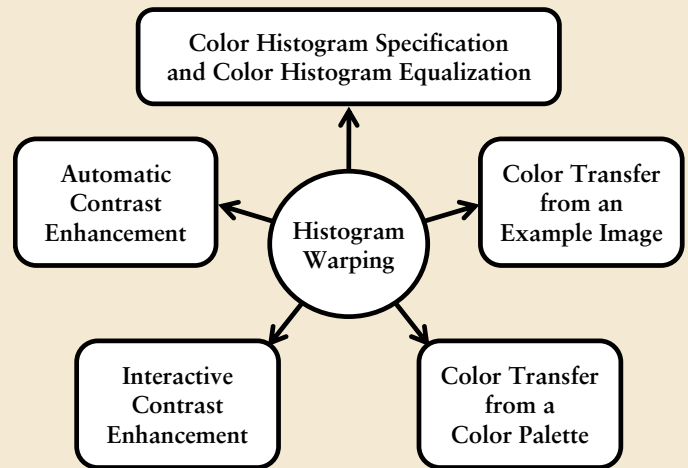


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Histogram warping is a new way to globally adjust the color and contrast of an image.

A spatially invariant image transformation is performed according to a luminance or color mapping function. Its slope determines the change in contrast while its displacement designates the shift in color. These color mapping functions operate independently on the axes of a suitably chosen color space.

The histogram warping transformation is controlled by specifying its desired effect on the color and contrast of a set of key colors. It is implemented using piecewise rational quadratic interpolating splines. By relying on these continuously differentiable, monotonic splines, our technique ensures that color and contrast change smoothly and predictably. It avoids introducing artificial discontinuities into the image histogram, thereby preventing the artifacts that can afflict other piecewise defined histogram transformations.



Prevention of False Contour Artifacts		Prevention of False Halo Artifacts	
Problem: The contrast changes too abruptly.	Solution: Apply continuously differentiable splines.	Problem: The natural order of colors isn't preserved.	Solution: Apply monotonic interpolating splines.
Standard Mapping by Linear Splines	Our Histogram Warping Technique	Standard Mapping by Cubic Splines	Our Histogram Warping Technique



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