

Image Processing Homework #1: Spatial Image Enhancement

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1 Technical Description

1.1 Power-Law (Gamma) Transformation

1.2 Histogram Equalization

1.3 Image Sharpening Using the Laplacian Operator

1.4 Implementation

1.4.1 Platform and Packages

1.4.2 Project Structure

1.4.3 Parameter Settings

1.4.4 Execution Flow

1.4.5 Usage

2 Experimental Results

2.1 Power-Law (Gamma) Transformation Results

2.2 Histogram Equalization Results

2.2.1 Histograms (before / after)

2.3 Image Sharpening Results

2.4 Per-Image Observations

2.4.1 Cameraman

2.4.2 Jetplane

2.4.3 Lake

2.4.4 Peppers

3 Discussions

3.1 Comparison of Methods

3.2 Method Analysis

3.2.1 Advantages

3.2.2 Disadvantages

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3.2.3 Limitations

3.2.4 Noise Amplification

3.3 Parameter Sensitivity

3.4 Possible Improvements