Image Enhancement

Contrast Adjustment (Improving Visibility) Contrast adjustment is a fundamental image enhancement technique that improves the visibility of features by expanding the intensity range of an image. This makes dark areas darker and bright areas brighter, enhancing overall clarity.

1. Key Concepts in Contrast Adjustment

* Why Adjust Contrast?
* Makes faint details more visible
* Improves object detection in computer vision
* Enhances visual quality for human viewing

Common Methods

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| Method | Description | Best For |
| Linear Contrast Stretching | Expands current min/max values to full range (0-255) | General purpose |
| Histogram Equalization | Spreads out intensity frequencies | Low-contrast images |
| Gamma Correction | Non-linear adjustment (power-law) | Brightness + contrast tuning |
| CLAHE | Adaptive histogram equalization | Avoiding over-amplification |

* Linear stretching is simplest but can amplify noise
* Histogram equalization works well for overall low contrast
* CLAHE prevents over-amplification in homogeneous regions
* Gamma correction provides non-linear control