DIGITAL IMAGE PROCESSING

Image Enhancement in Spatial Domain : Session1

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Today's Lecture

- **Image Enhancement in Spatial Domain**
  - **Intensity Transform**

Image Enhancement in Spatial Doma

Spatial Domain Vs. Transform Domain

- **Spatial domain:** image plane itself, directly process the intensity values of the image plane

- **Transform domain:** process the transform coefficients, not directly process the intensity values of the image plane

Image Enhancement in Spatial Doma

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Some Basic Intensity Transformation Functions

Image Enhancement in Spatial Doma

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Image Enhancement in Spatial Doma

Some Basic Intensity Transformation Functions

Example: Image Negative

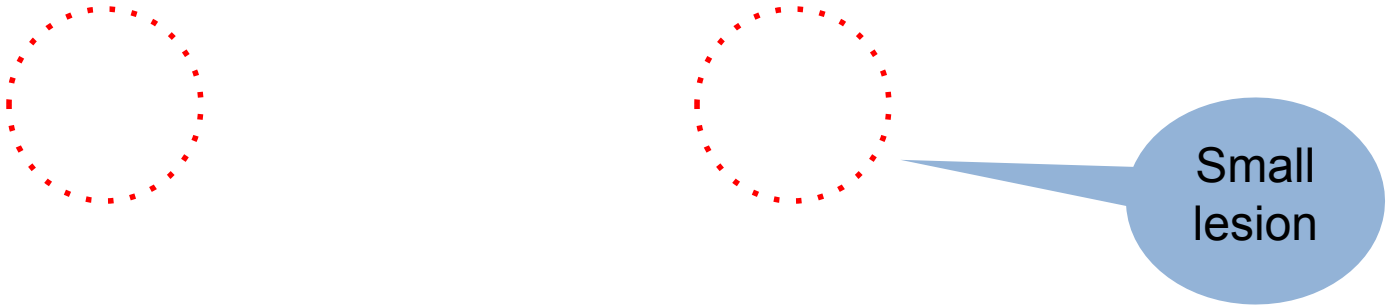

Image Enhancement in Spatial Doma

Some Basic Intensity Transformation Functions

Image Enhancement in Spatial Doma

Some Basic Intensity Transformation Functions

Example: Log Transformations

Image Enhancement in Spatial Doma

Some Basic Intensity Transformation Functions

Power-Law (Gamma) Transformations

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Some Basic Intensity Transformation Functions

Example: Gamma Transformations

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More Example: Gamma Transformations

Image Enhancement in Spatial Doma

More Example: Gamma Transformations

Image Enhancement in Spatial Doma

Piecewise-Linear Transformations

- **Contrast Stretching**
  Expands the range of intensity levels in an image so that it spans the full intensity range of the recording medium or display device.

- **Intensity-level Slicing**
  Highlighting a specific range of intensities in an image often is of interest.

Image Enhancement in Spatial Doma

Piecewise-Linear Transformations

Image Enhancement in Spatial Doma

Bit-plane Slicing

Image Enhancement in Spatial Doma

Bit-plane Slicing

Image Enhancement in Spatial Doma

Bit-plane Slicing

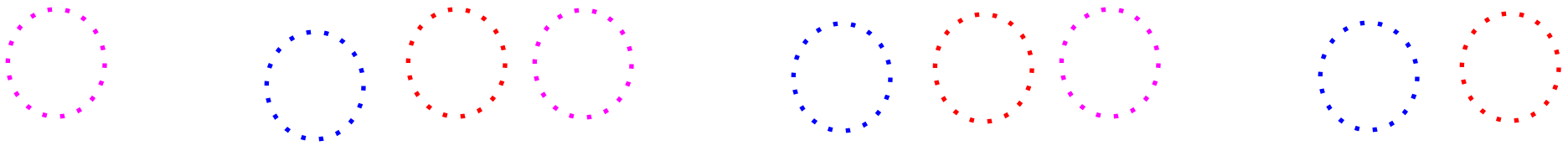

Image Enhancement in Spatial Doma

Histogram Processing

- **Histogram Equalization**
- **Histogram Matching**
- **Local Histogram Processing**
- **Using Histogram Statistics for Image Enhancement**

Image Enhancement in Spatial Doma

Histogram Processing

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Histogram Processing

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Histogram Processing

Next Class

- **Image Enhancement in Spatial Domain**
  - **Histogram Equalization**
  - **Histogram Matching**

Thank you:
Question?