Escuela Profesional de
Ciencia de la Computación

Computer graphics

Exponential and Raise to power Operators

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Overview

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Table of Contents

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Objectives

- Understand the difference between point, local and operators in image processing.

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Objectives

- Understand the difference between point, local and operators in image processing.
- Learn Exponential Operator method.

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Sample application

Figure: Sample application in pattern recognition

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Sample application

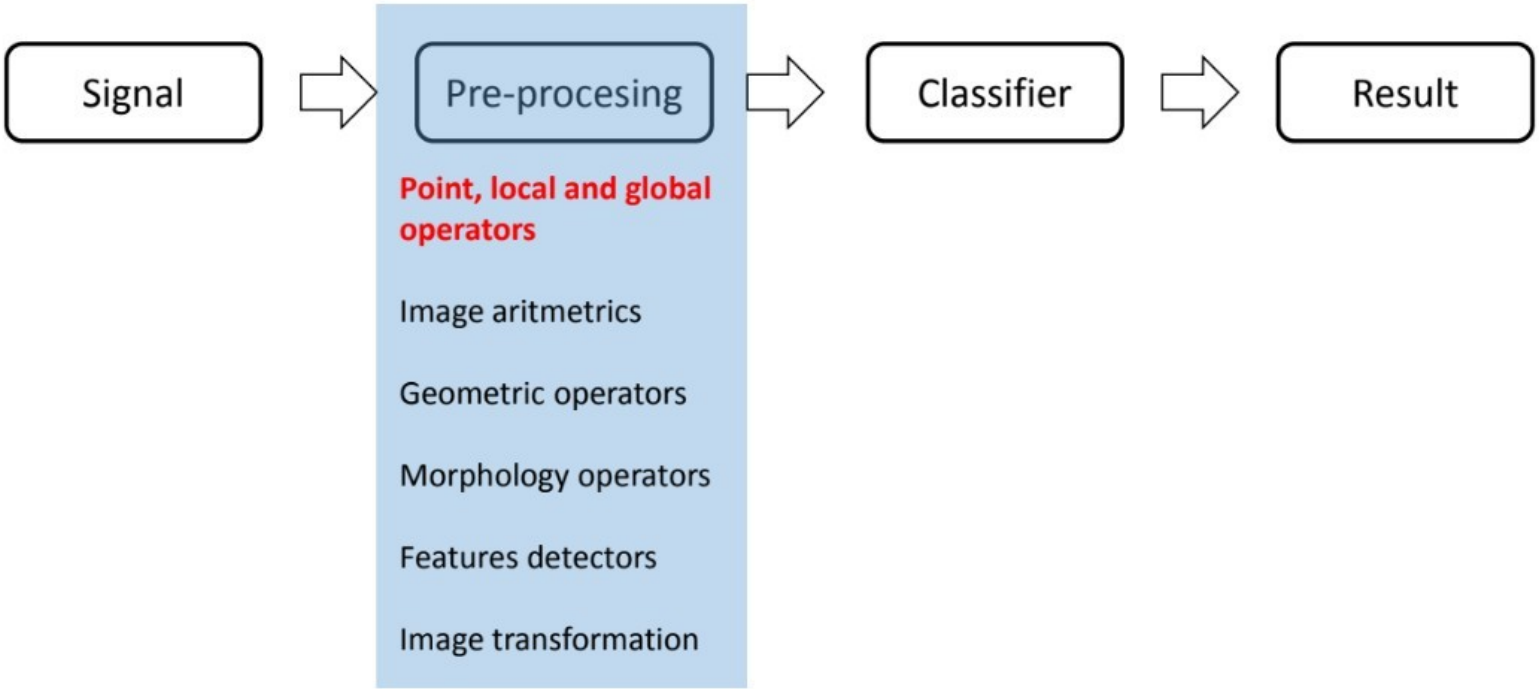

Figure: Sample application in pattern recognition

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Table of Contents

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Point operators

Example

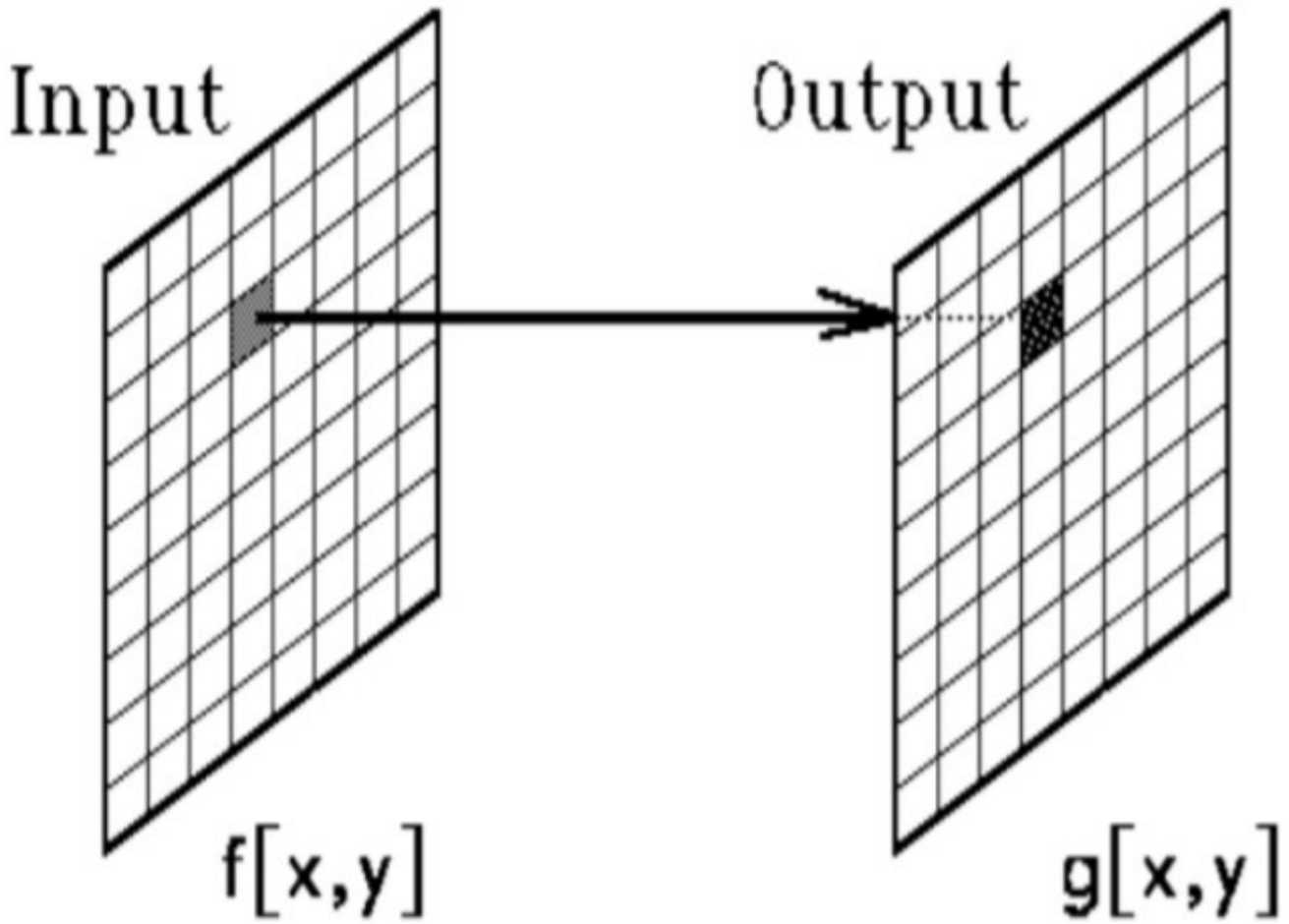

Figure: Point operator.

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Point operators

Formal definition

Point operator

$$O\{f[x,y]\} = g[x',y']$$

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Point operators

Examples

- Thresholding
- Contrast Stretching
- Histogram Equalization
- Logarithm Operator
- **Exponential/Raise to Power Operator**

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Exponential Operator

Figure: Original image. it have low intensity pixels.

Figure: Image after exponential operator.

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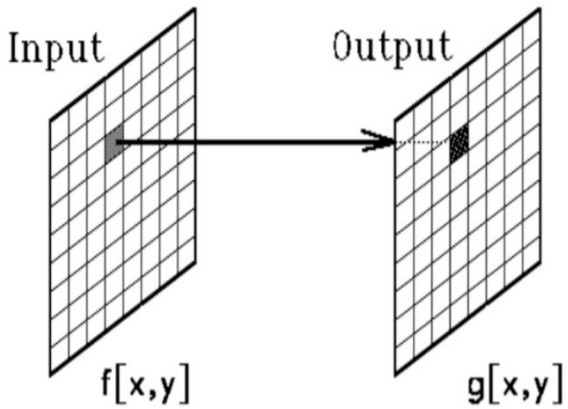
Exponential Operator

Definition



$$g[x,y] = c * (b^{f[x,y]} - 1)$$

Where:

- b : Constant.
- c : Constant.

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Exponential Operator

Examples

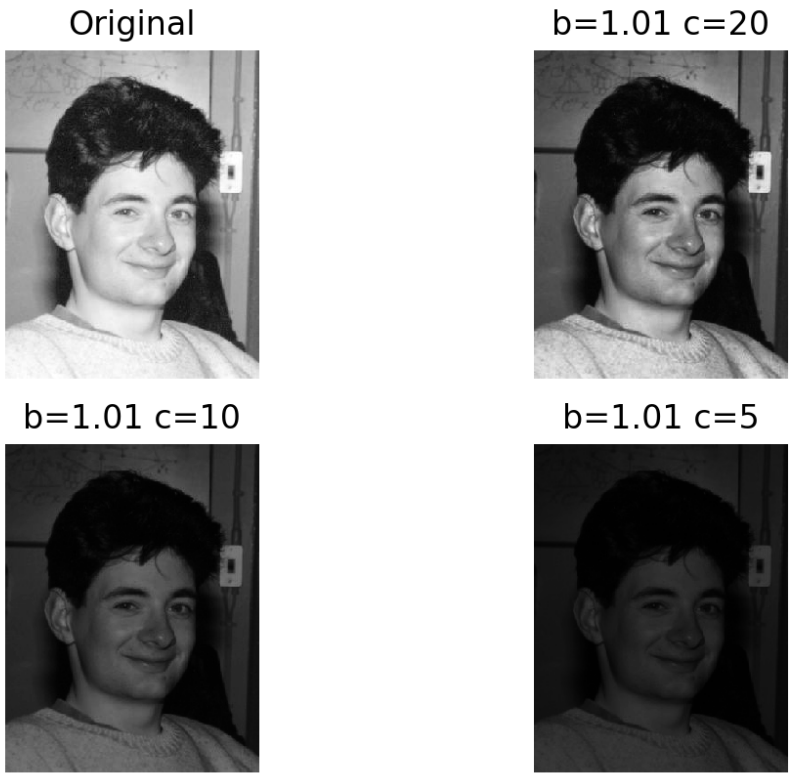

Figure: Example of exponential operator with different *c* values.

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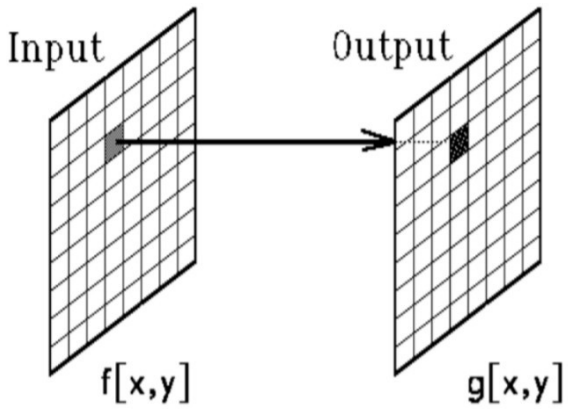
Raise to the power Operator

Definition



$$g[x, y] = c * f[x, y]^r$$

Where:

- r : Constant.
- c : Constant.

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Raise to the power Operator

Examples

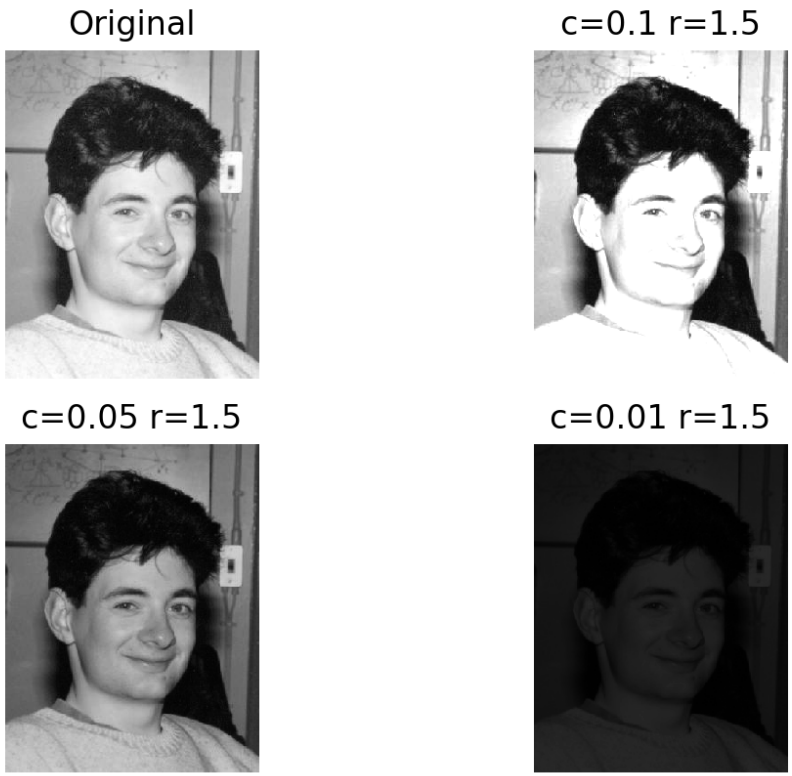

Figure: Example of raise to the power operator with different *c* values.

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Exponential and Raise to the power Operator

Like the logarithmic transform, they are used to change the dynamic range of an image. However, in contrast to the logarithmic operator, **they enhance high intensity pixel values**.

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Questions?

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