응용에서 영상처리 기술에 대한 비교

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Common Image Processing Techniques Comparison in Application

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ABSTRACT

The common image processing method treat the image as the array of pixels, and every pixel with its eight neighbors who directly around it form a square neighbor domain, sometimes may be more than that such as 5x5, or 7x7, and then adopt the convolution and template for every possible pixel value and then divide a attenuation factor, restrict the result in the area between 0 and 255, while the original and processed value record respectively. During the whole procedure, the result sole exist and represent the processing without changing the original pixel.

키워드

Image Processing Method, Convolution, Attenuation Factor

Ⅰ. Introduction

From the perspective of computer, an image is usually interpreted as a two dimensional array of brightness values, and then reduced to a series of numbers that can be manipulated by the computer. Each number representing the brightness value of the image at a particular location is called a pixel. Once the image has been digitized like this, there are at least three basic operations that can be performed on it in the computer [1]. For a point operation, a pixel value in the output image depends on a single pixel value in the input image. For local operations, several neighboring pixels in the input image determine the value of an output image pixel. In a global operation, all of the input image pixels contribute to an output image pixel value. These operations, taken singly or in combination, are the means by which the image is enhanced, restored, or compressed.

Ⅱ. Image Processing Method

(1) Gaussian smoothing[2]

The image smoothing is a kind of the image enhancement method, it average the gray value of the image neighbor domain by convolution, in order to reduce the noise effect and decay the contrast. The Gaussian smoothing is the favorite one out of them.

(2) Laplace sharpening[3]

In contrast to the Gaussian smoothing who can eliminate the noise points and reduce the contrast, the Laplace sharpening can enhance the outline and details to make the image clear.

(3) Image contrast effect

In brief, the idea of contrast effect is just use every pixel's opposite gray value in stead of the original one.

(4) Image black and white effect

From arctic aspect, the black and white image is full of nostalgic feelings, and tracing you back to the mesmerizing reminiscent of old school.

(5) Image fog effect

The fog effect import random mechanism for pixel processing.

(6) Image bright and dark effect

Image bright and dark effect is the fastest,

simplest, and the most representative method depending on the pixel point directly.

(7) Image median filter

The median filter is a non-linear digital filtering technique, often used to remove noise from image or other signals, especially treat speckle noise or salt and pepper noise.

(8) Canny edge detection

The definition of edge is the boundary between an object and the background, and indicates the boundary between overlapping objects. This means if the edges in an image can be identified accurately, all of the objects can be located and basic properties can be measured further. And edge detection is a tool in image processing aim at identifying points in a digital image at which the image brightness changes sharply or more formally has discontinuities [4]. So the Canny edge detection is the approach can delineate the main contours of image.

III. Experiment

Use the following image for experimentation

Fig. 1 The source image and The soft effect

Fig.2. The sharp effect and The fog effect

Fig.3 The contrast effect and The bright effect

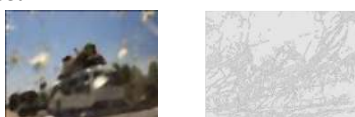
Fig.4 The dark effect and The black and white effect

Fig.5 The median filter effect and The Canny effect

IV. Conclusion

From the experimentation, every algorithm's feature has taken present obviously. Collecting their advantages means combining some of these methods in practice, but takes the Canny as example, its result can eliminate the star fracture, in other words, the noise points influence.

Therefore, these simple implement not only show us their special features, but also inspire us and force us further for their improvement.

Reference

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