Digital image: a picture is spatially divided into discrete points (or pixels), points (or pixels) of the gray quantized integer value used to represent discrete form form of a computer can handle.

Image: a natural or man-made biological observation system records the physical world, it is the physical energy as a carrier material for the recording medium with a form of information.

Digital Image Processing: A specific algorithm for digital image processing, in order to obtain visual, processes the digital image input interface hardware and software needed

4.

Image enhancement: selectively highlight of useful information for a specific application by a technology, weaken or suppress some useless information.

5.

Lossless compression: can the accuracy of the compressed data to restore the original data.

6.

Histogram: Histogram is a function of the gray level, describes the number of images that have the gray level of the pixel. Or: is the frequency histogram of an image reflected in each pixel grayscale appears.

Refinement: extracting a line width of an operating cell size centerline.

8,8-defined communication: the pixel having the value of V p and q, if q in the set N8 (p), the two pixels is called 8- communication. 9. filtering: median filter refers to the current pixel window (or areas) in all sorts of small to large gray pixels, the intermediate value as the current pixel output value. 10, the pixel neighborhood: refers to a neighborhood pixel (x, y) of the adjacent (surrounding) formed by a collection of pixels. I.e., {(x = p, y = q)} p, q is an arbitrary integer. Domain pixel neighbors: pixel p (x, y) of 4- neighborhood is: (x + 1, y), (x-1, y), (x, y + 1), (x, y-1) 11, histogram: the gray value of the independent variable, the gray level probability function obtained

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  11, histogram: the gray value of the independent variable, the gray level probability function curve is the histogram obtained.

12. lossless encoding: lossless compression image coding means by decompression can restore the original image without any loss of information coding techniques.

13. Histogram equalization: histogram equalization transform function is through the original image histogram is corrected to a flat histogram, in order to amend the gray value of the original image.

14. Sampling: image f (x, y) of the spatial position coordinates (x, y) for discrete values of the sampling function is called discrete points of the image.

15. quantization: sampling points corresponding to the continuous changes in the brightness range into a single specific digital process, known as quantization, ie discrete sampling points brightness.

16. The gray-scale image: the image of each pixel refers to a quantitative information made to describe the gray level, it is only the luminance information and no color information.

17. color: hue and saturation usually known as chroma, it indicates the type and degree of color shades.

18. Image sharpening: enhancing edge or contour of the image.

19. Histogram Specification (Match): The process of generating an image histogram for special method

20. Data Compression: refers to the amount of data required to reduce the amount of information given representation.

二：

1.

Several methods of image sharpening filter.

A: (1) instead of directly to the gradient values; (2) the combined threshold judgment; (3) to the edge of the provisions of a particular gray level; (4) provision for background gray level; (5) the gradient binarization image

2.

Pseudo-color enhancement and false color enhancement similarities and differences between points.

A: Pseudo-color enhancement is a gray-scale image through three kinds of transform three images were synthesized by a color image color; false color enhancement is a color image is processed to obtain the original images of different color image; the main difference lies in the different processed. The same point is the use of the human eye's ability to distinguish color gradation higher than the ability to distinguish the characteristics of the human eye target sensitive colors.

3.

What image coding basic principle? Redundant performance digital image, which has several manifestations?

A: Although an image requires a lot of data, but the image data are highly correlated, or redundant (Redundancy) information, after removing the redundant information can be effectively compressed image, while not damage the image of useful information.

Redundant mainly digital images in the following forms: spatial redundancy, temporal redundancy, visual redundancy, redundancy information entropy, structural redundancy and knowledge redundancy.

4.

What is a median filtering characteristics?

A: median filter refers to the current pixel window (or areas) in all sorts of small to large gray pixels, the intermediate value as the current pixel output value. Features: It is a non-linear image smoothing method, its pulse interference suppression effect good salt and pepper noise level, while suppressing random noise can effectively protect the edge of the less subject blur.

5. What is the histogram equalization?

Histogram of the original image is corrected by changing the uniform histogram function, then press the histogram equalization to amend the original image. After equalization image processing, image histogram is flat, i.e., each has the same gray level occurrence frequency number, then since the gray level having a uniform probability distribution,

Picture looks that much is clear.

6. What is the purpose of image enhancement?

A: The image enhancement intended to improve the visual appearance of the image, the image for a given application, purposefully emphasize whole or partial characteristics of the image, the original image becomes clear not clear or emphasize certain features of interest, widen the differences between the characteristics of different objects in the image, suppression characteristics are not interested, so that improved image quality, informative and strengthen the effect of image interpretation and recognition, needs special analysis.

7. What is the median filtering and other principles?

A: The median filter is a nonlinear smoothing techniques, the values ​​of all the pixel gray scale value of the gray value of each pixel that point it's a neighborhood window.

Median filter is based on a sort of statistical theory can effectively suppress noise of nonlinear signal processing technology, the basic principles of the median filter is a digital image or a digital sequence of values ​​that each point value with a neighborhood of the point instead of the values, so that the true value of the pixel values ​​close around, thus eliminating isolated noises.

8, image sharpening and image smoothing What is the difference and contact?

The difference: The image sharpness is used to enhance the edge, resulting in enhanced high-frequency component, which makes the image clear; image smoothing to eliminate image noise, but also easily lead to blurred edges.

Contact: both belong to image enhancement, improved image.

9, in the color image processing, often using the HSI model, which is suitable for doing image processing reasons:

1. HIS model in luminance component and chrominance components are separated; 2, hue and saturation of the concept of human perception are closely related.

10, image restoration(图像复原) and image enhancement（图像增强） of the main differences are:

Image enhancement is primarily a subjective process, and the image restoration is mainly an objective process; image enhancement without considering how the image is degraded, and image restoration need to know a priori knowledge of image degradation mechanisms and procedures, etc.

11, when the image enhancement, sharpening and smoothing methods which achieve?

Smooth Implementation: neighborhood average, median filtering, multi-image averaging method, frequency domain low pass filtering.

Implementation sharpening: the differential method, high-pass filtering method.

12. Description of the basic principles of the histogram equalization.

The basic idea of ​​the histogram equalization method is that for more than the number of pixels in the image be a gray level stretch, while a small number of pixels gray levels and is reduced. So as to achieve a clear image. Because the intensity distribution may be described in the histogram, so the image enhancement method is based on the histogram of the image.