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Questions.

1 Disuss the significance of sampling & quantization in process of digital images
2 Discuss the importance of image pre-processing in understanding the digital image data (A)
3 justify : image analysis and understanding is an useful task for better society building. (A)
4 Discuss the importance of biometric technology considering the current application
5 Explain "image representation"

Answers.

1

Creating a digital image. we need to convert the continouse sensed data into digital form.
The process include 2 processes.
- Sampling :
  Digitizing the co-ordinate value is called sampling.
- Quantization :
  Digitizing the amplitude value is called quantization.

simpling is the reduction of a continous time signal to a dissorete-time signal. Simpling is done prior to the quentization process. It takes two forms : spatial and temporal

Spatial sampling is essentially the choice of 2 D resolution of an image.
the values on the chart, usually amplitude
In the simpling process, a single amplitude value is selected from different values of the time interval to represent it.

Quentization is the process of mapping input values from a large set to output values in a smaller set, often with a finite number of element. Quentization is the opposite of simpling. It is done on the y-axis. When you are quentizing a image you are actually dividing a signal into quenta (partitions).
Therefor, digitizing the amplitudes is what is referred to as quantization

2. preprocessing is a common name for operations with image at the lowest level of abstraction - both input and output are intensity images. These iconic images are of the same kind as the original data captured by the sensor, with an intensity image usually represented by a matrix of image function values. (brightnesses). The aim of pre processing is an improvement of the image data that suppresses unwilling distortions or enhances some image feature important for further processing, although geometric transformation of images are classified among pre-processing methods here since similar techniques are used.

3

Today, the use of computer-assisted methods for analysis and evaluation of microscopic image is inevitable. The initial task of image processing is to enhance the quality of digital image for further analysis. This optimisation comprises the use of greyscale contrast, shading correction, specific filtering methodes. Special image analysis procedures for determination of periodicities in micrographs involve the use of fourier analysis. The chapter also describes the application of stereoscopic imaging to show the topography of the simple surface.

4

Biometric technology is one of the most important fields of application of image processing techniques and have a great interest in science and technology. security, authentication and bio-medical applications are fields where biometric techniques are widely used.

One of the main challenges in dealing with very large databases of images is establishing a low dimensional feature representation having enough discriminatory power to perform high accuracy classification and prediction with the corresponding uncertainly quantification. Many different methodes of supervised and unsupervised classification have been already presented in the literature. but no numerical comparison between all of those methodes has been performed using the same database and the same training conditions

5 Image representation definition.

A digital image is an representation of two-dimentional image as a finite set of digital values, called picture elements or pixels.

Pixel values typically represent gray levels, colors, heights, opacities and so on. The smallest addressable image element is called pixel. The array is called a bitmap. The representation of an image can takes many forms. Most of the time it refers to the way that the conveyed information such as color, is coded digitally and how the image is stored. Several open or patented standards were proposed to created, manipulate store and exchange digital images.

Differently, the visual content of the image can also take part in its representation. This more recent concept has provided new approaches of representation and new standards.