
IMAGE PROCESSING (IMAGE ANALYSIS) USING STATISTICAL FUNCTION

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ABSTRACT

As the information on web increasingly rapidly it becomes difficult retrieve relevant document or text data from web. Image processing is an area characterized by the need for extensive experimental work to establish the viability of proposed solutions to a given problem. Image processing used in Geographical Information System (GIS).It is used for capturing, storing querying, analyzing, and displaying data about any entity which can be geographically referenced.

The present investigation is to apply digital analysis for identifying the statistical function, mean, standard deviation, image histogram, and intensity values on images by using MATLAB. MATLAB and image processing toolbox provide wide range of advance image processing functions and interactive tools for enhancing and analyzing digital images. The toolbox functions implemented in the open MATLAB language has been used to develop the customizes algorithm.

By using MATLAB is a wide range of application including image processing and visualizing the data.As,a result we can claim now, this software can produced relatively accurate output from the input supplied. The output produced by using the function gives the probability of relevant document associated with user query. The present study revealed efficacy of various images processing analysis using statistical function representing features such as mean, standard deviation, histogram of image and intensity values on images.

A variety of methods are available for analyzing images. The present paper deal with the methods will be evaluated using statistical function used as an effective means of creating the graphical form of image. A brief overview of some of the most common Statistical function, and find out the result. It discusses the "Statistical function" and reviews some of the common image analysis technique, statistical function and related project.

Introduction

Popularity of Internet growing rapidly because the enormous image or statistical / mathematical information is made available on it. There are various search engines those are useful for accessing information but some of time these information may be relevant to user query or may not be relevant so finding the relevant data on web is called database discovery problem. So to some this problem many efforts had made. Due to expandability information on information retrieval system has much demand help to search a relevant data on web. That's why the tremendous number of automated system area developed for searching information on web.

In this paper, I propose the statistical approach to solve the problem. In this approach in which the knowledge for the database discover is distributed over a number of hierarchically data which reduced the total training cost at acceptable level and discover the database associated with relevant document and retrieve these documents on the basis of analysis with statistical function learning mechanism.

Objectives

The objective of this paper to introduce the concept, method, analysis and understanding of images. In image processing system implement the statistical function fusing basic programming in MATLAB to present

fundamental for method of processing analysis of image using statistical function. It is useful in enhancing the quality of image.

The theme of the paper is to find out statistical function to find an approximate relevant document i.e. relevant function from the dated related to it and its characteristics. The software is design to associate the input data with output and to find the result in graphical form using various statistical functions. The model is trained on the basis of previously available data with sufficient large amount and then statistical functions are then used to predict the result for future. This method used to improve the quality of any image that will be used this system.

Overview of Development

Image processing generally involves three steps:

- (i) Import an image or directly through digital photography.
- (ii) Manipulate or analyze the image in some way. This stage can include image enhancement and data compression, or the image may be analyzed to find patterns that are not visible by the human eye.
- (iii) Output the result. The result might be the image altered in some way or it might be a report based on analysis of the image.

On the basis of review of the literature, it can be stated that the image processing technique is based on using analogue and digital electronic device and system which allows an image with special information distribution to be placed at the input or output of the system.

Statistical Function

It analyze the general characterized of an image by :-

- ◆ Computing the mean
- ◆ Computing the standard deviation.
- ◆ Displaying an image histogram
- ◆ Plotting intensity values of image.

By using MATLAB 7.0.1.in a wide range of application including image processing and visualizing data, we performed the statistical function such as mean, standard deviation, displaying image histogram and plotting the profile of intensity value on image or an X-ray CT scan. The plot fits panel allowed us to visually explore multiple fits to the current histogram data.

The aim of our investigation is to apply digital analysis for identifying the statistical function, standard deviation, mean, image histogram and intensity values of images by using MATLAB.

MATLAB and image processing toolbox provide a wide rage of advance image processing functions and interactive tools for enhancing and analyzing digital images. The interactive tools allowed us to perform spatial image transformations, morphological operations such as, edge detection and noise removal, region of interest, ROI processing, filtering and basic statistical function. The toolbox functions implemented in the open MATLAB language has been used to develop the customized algorithm.

With the advent of the third generation digital computer around the middle of 1960s, the area of digital image processing and analysis has emerged as a subject of interdisciplinary study and research in physics, chemistry, biology, engineering, meteorology, space science, statistical, agriculture and of course computer science. Two dimensional and three dimensional image processing and analysis today form a major area of research and development in the broad

area of pattern recognition, computer vision and also of artificial intelligence. In early 1980s, when the fifth generation computer systems / knowledge-based computing systems (FGCS/KBCS) were launched in different countries like Japan, USA, Europe and also in India, with the objective of designing and making automation that can carry out certain tasks as we human being perform. The result of these efforts established image processing and computer vision as one of the fastest growing technology worldwide.

Digital image processing used to be single unified field the early sixties and seventies. Today, it has expanded and diversified into several branches based on mathematical tools as well as applications.

A major portion of information received by a human from the environment is visual. Hence processing visual information by computer has been drawing a very significant attention of the researchers over the last few decades. The process of receiving and analyzing visual information by the human species is defined as, sight, perception or understanding, similarly, the process of receiving and analyzing visual information by digital computer called digital image processing and scene analysis.

The digital analysis of two dimensional (2-D) image is based on processing the image acquirement, with the use of computer. The image is described by a 2-D matrix of real or imaginary numbers presented by a definite number of bytes.

Application of Image Processing

- 1) **Office automation :**
OCR; document processing; logo and icon recognition; identification of address area on envelop etc.
- 2) **Industrial automation :**

Automatic assembling, process related to the VLSI manufacturing, robotics, process control application etc.

- 3) **Bio-medical :**
ECG, EEG, EMB analysis, X-ray image analysis, automated pathology, 3-D reconstruction and analysis.
- 4) **Remote sensing :**
Estimated related to the agriculture, environment and pollution control, monitoring traffic along road etc.
- 5) **Scientific applications :**
High energy physic, bubble chamber and other forms of track analysis etc.
- 6) **Information technology :**
Video-conferencing and videophones, image transmission, videotext etc.
- 7) **Entertainment and Consumer electronics :**
Multimedia and video editing, HDTV, etc.
- 8) **Printing and Graphics Art :**
Color fidelity in desktop publishing, art conservation etc.

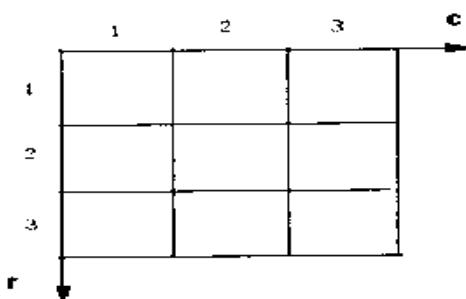
Overview of Image

Image Structure:

The primary definitions you need to know are summarized as follows:-

- **Images** as two-dimensional arrays (i.e., matrices), in which each element of the matrix corresponds to a single **pixel** in the displayed image. Pixel is derived from **picture element** and usually denotes a single dot on a computer display. For example, an image composed of 200 rows and 300 columns of different colored dots would mean 60000 pixels.

- Image **resolution** can be defined as the height and width of an image as a quantity of pixels in each direction, **or** it can be defined as the number of pixels per linear measure, such as 100 pixels per inch.
- **RGB images** do not use a palette. The color of each pixel is determined by the combination of the red, green, and blue intensities stored in each color plane at the pixel's location. Graphics file formats store RGB images as 24-bit images, where the red, green, and blue components are 8 bits each. This yields a potential of 16 million colors.
- A pixel whose color components are (0, 0, 0) displays as black, and a pixel whose color components are (255, 255, 255) displays as **white**. The three-color components for each pixel are stored along the third dimension of the data array.
- One of the most convenient methods for expressing locations in an image is to **use pixel coordinates**. In this coordinate system, the image is treated as a grid of discrete elements, ordered from top to bottom and left to right, as illustrated by the following figure.



- downward, while the second component c (the column) increases to the right. Pixel

coordinates are integer values and range between 1 and the length of the row or column.

- **Neighbourhood operation** is an operation in which each output pixel is computed from a set of neighbouring input pixels. Convolution, dilation, and median filtering are examples of neighbourhood operations.
- **Convolution** is a neighbourhood operation in which each output pixel is a weighted sum of neighbouring input pixels. Image processing operations implemented with convolution include smoothing, sharpening, and edge enhancement.
- **Edge** is curve that follows a path of rapid change in image intensity. Edges are often associated with the boundaries of objects in a scene. Edge detection is used Figure 4 The Pixel Coordinate System to identify the edges in an image.

The **functional techniques** required to be understood before performing the various image enhancements.

Image Analysis

Image analysis combines techniques that compute statistics and measurements based on the gray-level intensities of the image pixels. You can use the image analysis functions to determine whether the image quality is good enough for your inspection task. Also, you can analyze an image to understand its content and to decide which type of inspection tools to use to solve your application. Image analysis functions also provide measurements that

you can use to perform basic inspection tasks such as presence or absence verification.

Analyzing Images:-

Image Processing Toolbox provides a comprehensive suite of reference-standard algorithms and graphical tools for image analysis tasks such as statistical analysis, feature extraction, and property measurement.

Statistical functions:-

You analyze the general characteristics of an image by:

- Computing the mean or standard deviation
- Determining the intensity values along a line segment
- Displaying an image histogram
- Plotting a profile of intensity values.

Scope of Future Work

The work presented in this paper can be extended to the following areas :

- ★ In this paper to design a software tool that carries a variety of image processing to improve the quality of any image that will be used in graphical form statistical function.
- ★ The scope of the paper is designed in such a way that, so as to provide decent level of improvement in image quality.
- ★ The modern technique developing for effective image analysis for extended to any other statistical function.
- ★ To create a system with statistical interface so that one can easily enter the input data and the system can predict the result.
- ★ Software or model can be developed for and implemented for another type of information maps (such as image)

- ★ It uses statistical learning techniques for investigating the difference between two or more images in statistical analysis.
- ★ Apply image correction technique enables a detailed identification of the different images using analyzing the images.
- ★ The parameters which have not given the importance may also be considered while developing a new system based on this approach.

The above mentioned areas will help in further performance improvements the quality of image that can be added to another statistical function. The methodology used for analyzing the image can play an important role in finding the statistical function. The work will be helpful to finding data from large database in the form of graphical chart using the histogram (plot and equalization) and intensity values on images or data. The work also will be helpful to prepare an advanced statistical function with addition of behavioral parameters so that more realistic result can be drawn.

Conclusion

In the present study, our attempt is to brief overview of the method for an evaluation of image analysis using statistical function. MATLAB provide interactive tools and command functions for analysis of statistical function such as : mean, median, standard deviation, histogram and intensity values on images of data with both 2-D and 3-D plotting functions. It has been also used to reveal the wide variety of graphs generated with histogram.

MATLAB provide functions and interactive tools analyzing digital images and developing image processing algorithms. MATLAB visualization tools

let us to represent the information contained in the image data through mean, standard deviation, histogram and intensity values of image.

On the basis of an analysis of the digital image analysis method in statistical function and practice and as a result of many attempts, authors have developed an original method of image analysis designed for estimating the parameters or some statistical function of images. As a result of the image analysis may serve for further investigation of the quality of image. MATLAB provide

command line function for analysis of medical imaging such as basic statistics, matrix analysis, and curve fitting, allowing us to visualize vector of data with both 2-D and 3-D plotting functions.

The result of analysis consists of Maps (or image), data and a report. These three components of the result provide user with full information concerning the source data, the method of analysis and the outcome and its reliability in this work. These technique and image processing tools carried out the image of this system.

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