INTRODUCTION TO DIGITAL IMAGE PROCESSING

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Abstract

The digital image processing is a technique which can applied on Input Image to transform into output image or extract information from Image processing is a procedure of converting an image into digital form and carry out some operation on it, in order to get an improved image and take out several helpful information from it The present paper is aimed to explore commonly used techniques and its applications in the field of digital image processing some of the important applications of image processing in the field of science and technology containing computer vision, remote sensing, feature extraction, face detection, forecasting, optical character characterization, finger printing detection etc. The field of digital image processing refers to processing image by means of digital computer.

Keywords *– digital Image, forecasting, remote sensing, finger prancing.*

Introduction

The digital Image processing is dependson tow principle applications which include improvement of pictorial information for human interpretation and other is processing of image data for storage, transmission and representation for autonomous machine perception. The image processing generally refers to digital image processing it is also refers to optical and analog image processing. Digital Image processing is multidisciplinary science that makes employ the principles from various fields such as optics, computer science, mathematics, physics and visual psychophysics.

An Image contains sub images which is referred as a regions of interest the image regularly contains group of objects each of which is the basis for a region most generally image processing requires the image to be available in digitized form the field of digital image processing refers to processing digital image by means of a digital computer the digital image is composed of a finite number of dements each of which has a particular location and value these elements are called picture elements image elements, pets and pixels. Pixels are the term used most widely to denote the elements of a digital image.

Application

(1) Image Enhancing – Image Enhancement

Encompasses the processes of changing image, whether they are traditional photo – chemical photo graph, digital photograph conventional analog image enhancing is known as photo retouching, using tools such as an airbrush to change photo graphs or editing design with any medium of traditional art.

(2) Image Restoration

Image Restoration is operation of a taking a noisy corrupted

image and estimates the clean creative image altered from may come in many forms such as motion blur, noise, and camera miss-focus. Image restoration is different from image enhancement.

(3) Image compression

It is used to decrease insignificance and idleness of the image data in order to be able to store or transmit data in incompetent form Image compression may be lossless density is favored for archival reasons and frequently for medical image processing, technical draining, clipart or comics.

(4) Character Recognition

Optical character appreciation, usually abbreviated to OCR is the mechanical or electronic alteration of scanned or photo images of typewritten or printed text into machine encoded i.e. computer – readable text. It is generally used as an appearance of records access from a little kind of original data source; It is an ordinary technique of digitizing printed manuscripts such that they can be by electronic means edited.

(5) Signature Verification

A digital signature is mathematical scheme for presenting the legitimacy of a digital communication. A legal digital signature affords a receiver reason to consider that the message was created by recognized sender.

(6) **Biometric**

Biometric refers to the automatic identification of humans by their behaviors of characteristics. Biometric is recycled in computer science as a type of identification and access control. It is also used to recognized individuals in groups that are under surveillance.

(7) Object Recognition

Object detection is a computer technology related to computer vision and Image processing that deals with noticing illustrations of semantic objects of a classes such as humans, buildings well researched domain of object detection include face detection and pedestrian detection.

(8) Automatic Target Recognition

Automatic target recognition is the skill for an algorithm or device to distinguish objects or target stands on data gained from sensors ATR machines are used in unmanned aerial vehicle and cruise missiles.

Fundamental Steps in Digital Image Processing

It contain following steps.

(a) Image acquisition

Acquisition could be as simple as being given an image that is already in digital form generally the image the image acquisition stage involves processing.

(b) Image enhancement

It is the process of manipulating an image so that the result is more suitable than the original for a specific application. Enhancement technique are so varid and used so many different image. Processing approaches that it is difficult to assemble a meaningful body of techniques suitable for

enhancement without extensive back ground development.

(c) Image restoration

It is an area which deals with improving the appearance of an image restoration is objective in the sense that restoration techniques tend to be based on mathematical models of image degradation.

(d) Color Image Processing

It has been gaining in importance because of significant increase in the use of digital images over the internet.

(e) Compression

It is the name implies, deals with technique for reducing the storage required to save an image or the bandwidth required to transmit it image compression is familiar to most users of computers in the form of image file extension such as the jpg file extension used in the JPEG.

(f) Morphological processing

It deals with tools for extracting image components that are useful in representation and description of shapes.

Segmentation Procedure:-

It partition into Its constituent parts or objects the autonomous segmentation is one of the most difficult tasks in digital image processing A rugged segmentation procedure brings the process a long way towards successful solution of imaging problems that require objects to be identified individually.

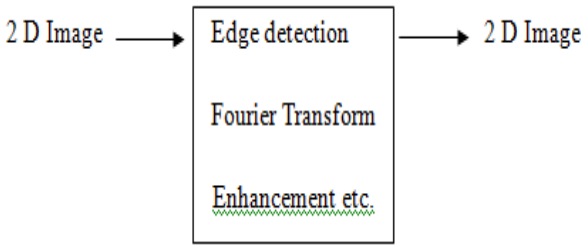
Representation &description:-

This is the method used to specify for describing the data so that features of interest are highlighted description is also called feature selection deals with extracting attributes that result in some quantitative information of interest.

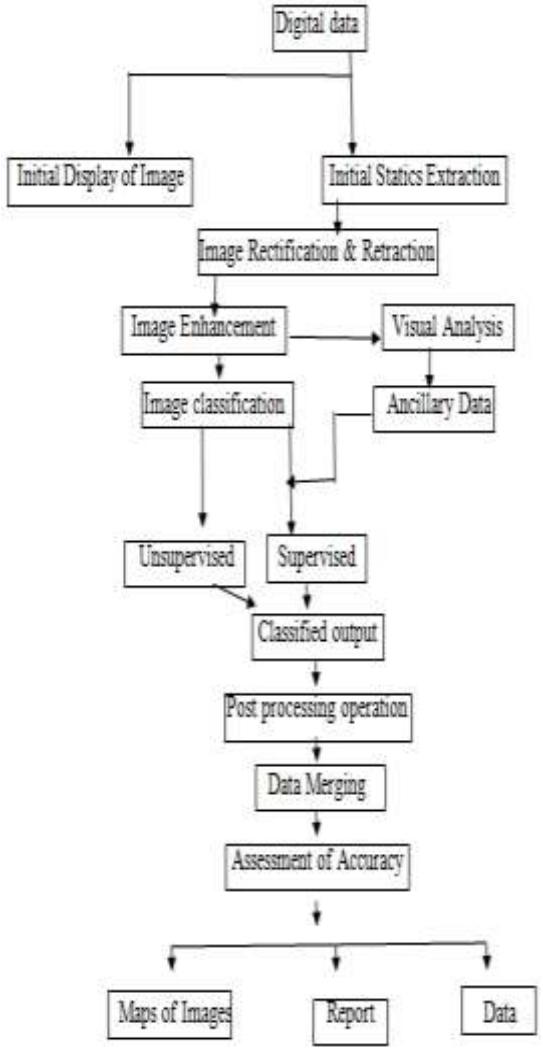
Recognition:-

It is the process that assigns a label the coverage of digital image processing with the development of methods for recognition of individual objects.

Flow chart of image processing progression



Block Map of Image Processing



Conclusion

This paper presented the different application of digital image processing which include image enhancing, image restoration ,image compression ,character recognition, signature verification ,biometric , object recognition, automatic target recognition, the it is observed that data image processing is depends on two principle which include pictorial information and data for storage ,transmission and representation it is advanced technology which was useful for human being.

References

1. *B.B. Chaudhuri and U. Pal. "an OCR System to Read Two Indian Language Scripts: Bangla and Devnagari (Hindi)", IEEE,pp. 1011-1015 vol.2, 1997*
2. *Keechul Jung, Kwangln Kim and Anil K. Jain, Text information extraction in images and video: a survey, The journal of the Pattern Recognition society, 2004.*
3. *Kongqiao Wang and Jari A. Kangas, Character location in scene images from digital camera, the journal of the Pattern Recognition society, 2003*
4. *G. Rama Mohan Babu, P. Srimaiyee, A. Srikrishna, "Text Extraction From Heterogeneous Images Using Mathematical Morphology", Journal of Theoretical And Applied Information Technology, Vol.16,No.1,pp 39-47,2011.*
5. *Veena Bansla and R M K Sinha, " A Complete OCR for printed Hindi Text in Devanagari Script", IEEE 800-804, 2001*
6. *Adyta Raj, Ranjeet Srivastava, Tushar Patnaik, Bhupendra Kumar, "A Survey of Feature Extraction and Classification Techniques Used In Character Recognition for Indian Scripts", International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249-8958, Volume-2, Issue-3 February 2013*
7. *Atul Negi, Chakravarthy Bhagvati, B. Krishna, "An OCR system for Telugu", IEEE 1110-1114-2001*
8. *Amritha Sampath, Tripti C, Govindaru V, "Freeman Code based online handwritten character recognition for Malayalam using backpropgation neural networks", International journal on Advanced computing, Vol. 3, No. 4, 2012:51-58*
9. *S. A. Angadi, M.M. Kodabagi, "A Texture Based Methodology for Text Region Extraction From Low*

Resolution Natural Scene Images", International Journal of Image Processing (Ijip) Volume (3), Issue (5), 2009

10. *Chaudhuri, B.B, Pal, U., Mitra, M., "Automatic recognition of printed Oriya script", IEEE pp.795-799,2000.*
11. *K Jithesh, K G Sulochana & R Ravindra Kumar, " OPTICAL CHARACTER RECOGNITION FOR MALAYALAM", published by Centre for Development of Advanced Computing.*
12. *C.P. Sumathi, T. Santhanam and G. Gayathri Devi, "A Survey On Various Approaches of Text Extraction In Images", International Journal of Computer Science & Engineering Survey (IJCSES), pp 27-42, Vol.3, No. 4, August 2012.*
13. *Raju G, "Wavelet Transform and Projection Profiles in Handwritten Character Recognition – A Performance Analysis" (2008), 16 th International Conference on Digital Object Identifier (ADCOM), IEEE, pp. 309-314.*