Application of Image Processing in Real World

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Abstract:- Image processing is a hot topic in ten-year research. Digital Image Processing Areas that use image information to identify, process data for the storage, conversion and implementation of an independent vision for the machine. Our aim is to explain the importance of image processing, as well as the tools and processes in use in different areas.

Keywords:- Processing, Image Enhancement, Machine Vision, Digital Image, Visual System.

I. INTRODUCTION

Image processing is a method that performs certain functions in an image, to get a improved image or extract adequate important information from it[3]. Image processing is the method in which the input image provides the output of an image or some features of the image. Image processing is the fastest growing technologies now a day. It also lies under a core research topic in engineering &computer science [13].

Image processing considers these three steps:
- Image import by detection tools
- Image analysis and editing
- Effect can be changed to an image or report based on image analysis.

Image processing are of two types:-Analog & Digital.

Processing of Hard copies like printers and photographs come under the category of analog processing. Digital processing techniques help to convert digital images using computers. The three most common categories all data types have to go through while using the digital method are pre-processing, development, and presentation, to extract information[4].

II. DIGITAL IMAGE PROCESSING

In digital Image processing there are two methods. In one method input and output both are images and in the other one input is an image and output will be some features of the image.

In the processing of digital image the acquisition is the initial step in which digital form image is given directly as an input. After image acquisition we used to improve the image, which is one of the easiest and most attractive places to process digital photography [13]. Basically, the idea of a development strategy is to extract hidden information, or simply to highlight certain aspects of the image that you are interested in. A common example of enhancement is when we increase image brightness because it "looks better." It is important to remember that development is the lowest point for image processing. Photo retrieval is also an area that is responsible for improving image appearance. However,

unlike refinement, considerate, image restoration has used to restorative techniques based on statistical or probable models of image destruction. Color image processing is an area that has been gaining momentum due to the use of digital images on the internet in an good quantity [14]. It involves the analysis on the basic concepts in color models as well as their basic color analysis in a digital form environment [14]. Color of the image can be used as a base for drawing features that you are interested in photographing.

Wavelets are the basis for representing images with various levels of resolution. This is especially true for online use, which is characterized by important graphic content.

Image compression is common to many computer users in the form of an image file extension, such as a jpg file extension used in the Joint Photographic Experts Group (JPEG) image compression level. Morphological analysis interacts with the extraction tools that are useful for visualizing and interpreting the situation.

This image processing is the starting of a transition from all the processes which produce attributes towards the image.. Separation processes divide an image into its parts/objects. Also stand-alone is the most difficult work in digital photography. The rough segmentation process brings the process a long way in solving image problems that require things to be individually identified. On the other hand, weak or flexible separation algorithms almost always guarantee failure in the end. In general, the more accurate the distortion, the more likely the recognition will be. Representation and meaning almost always follows the output of the classification phase, usually the green pixel data, which covers the region boundary or all points in the region only.

A. Visual and Auto Testing
Visual and auto testing methods are important to improve quantity and quality of the product in the manufacturing and integrated industries.

B. Incorrect component identification:
In the use of electrical or electromechanical systems, visual inspection plays an important role to identify faulty components. The defective parts usually produce a lot of heat energy. Infra-red images are generated by the distribution of thermal energy in the compound. We can easily find out the defective components in the assembly by the use of IR images.

C. Automatic site inspection systems:
Location detection errors are an essential requirement in many metal industries. For example, in hot or cold mills rolling over a metal plant, it is necessary to detect any deviation in the folded metal surface. This can be done by

using image processing techniques such as edge detection, texture detection, fractal analysis, and more [13].

D. Security surveillance

The use of image processing techniques in self-defense is an important part of research [13]. There is an urgent need to monitor land and oceans using air surveillance techniques [13]. Suppose we were interested in discovering the types and designs of seafood in a picture above the ocean surface. The main task here is to separate the different elements in the body part of the image. After subtracting segments, parameters such as area, area, perimeter, alignment, shape, length, width, and aspect ratio are available, to separate each of the different elements. These items can range from small boats to large ocean-going vessels [13].

By using the features above it is possible to identify and locate these objects locally. To define all possible shipping structures, we need to be able to identify the distribution of these properties in eight possible areas, namely, north, south, east, west, north-east, northwest, south-east and southwest. From the geographical distribution of these objects it is possible to translate the whole oceanic area, which is important for the protection of the ocean[13].

E. Content-Based Image Recovery

Image retrieval from a large collection is an essential process application of processing of an image. The advent of a large collection of mixed and digital libraries has given rise to an urgent need for the development of identification tools and information retrieval. There are a good number of search engines available today for easy-to-read text, but not many quick tools to retrieve text and color images.

Traditional methods of searching and indexing images are slow and expensive. Therefore there is an urgent need for the development of image retrieval algorithms using embedded materials.

Digital image elements such as size, texture, color, topology of objects can be used as reference keys to search and retrieve image information on a large image site. Image-based content retrieval is commonly known as content-based content retrieval.

F. Biomedical Imaging Techniques

Medical imaging like X-rays, CT Scans, ultrasound are widely considerin the diagnosis of different disease. Diffrent biomedical images taken with anotherimaging modalities such as CT-scans, X-rays and MRIs.

Some applications of biomedical imaging are presented below.

Diagnosis of lung disease
Heart disease diagnosis
Digital mammogram

G. Diagnosis of lung disease

X-ray of the chest includes, the airway appears darker, while the firmer tissues appear lighter. Bones have a much more opaque radius than soft tissue. The chest X-ray film is consisting of mainly the ribs, thoracic spine, heart, and diaphragm that separate the thoracic cavity and abdominal cavity. On chest radiograph these areas are examined for abnormalities by analyzing the relevant parts.

H. Diagnosis of heart disease:

Measurements of heart size and its posture are very important clinical factors in the differentiation of heart disease. Imaging Methods for radiographic imaging can be used for better diagnosis of heart disease.

I. Digital Mammogram:

It is very useful to find out the clinical features of tumors [9].

Image processing methods like brightness enlargement, contrast, feature removal, analysis of its shape are considered to analyze mammograms.

The size of the tumor and its characteristics determine whether the tumor is malignant or not. Diagnosis of brain diseases, tumors and cancer can be done with the help of image processing using MRI, PET scan etc. [5].

J. Computer Vision

It is an automatic method, which considers science as wellTechnology [4]. Computer theory is related to the theory of design systems can find information in pictures. Input as an image can be provided in many formats, like video signal sequence, multiple views of cameras and input from a medical scanner [4].

Examples the use of computer vision includes process control systems such as an industrial robot or in private vehicle; detecting events such as visual surveillance or census; editing information such as photographic archives and image sequences; modeling items or areas such as industrial testing, medical image analysis or environmental modeling; interactions as installed in the interactive device between the computer and the person[4].

K. Face Recognition

In this way important features are detected and some are ignored. Face acquisition can be considered a typical case for the acquisition of a class of objects [2].

The purpose of detection is to detect the specific features of locations and the size of the number of known faces. Various face recognition algorithms focusing on viewing the person's face in front. It is also an attempt at General Knowledge and Difficulty Problems with Multi-Scene Detection.

L. Motion Tracking

Objects which are moving, measuring there movement limits and describe a visual record of moving objects, is thecrucial area of application in image processing[13].

It has usually two appropriate ways to track an item:
Visual-based tracking
Movement-based Tracking.

A targeted tracking system as fast as a military aircraft, arrows are developed based on movement-based prediction techniques such as Kalman filters, extended Kalman filters, particle filters, etc [14].

In image tracking systems based on image processing, target objects entering the sensor view are automatically detected without human intervention[13].

Tracking of a visual-based object, a pattern is seen in consecutive frames and tracking is done on the basis on its positioning information[13].

III. CONCLUSION

Image processing has many applications that the researcher chooses as one of their favorite areas. Manyof research findings have been already published but still many of the research sites are open in image processing. As the speed of computers and the speed of signal processors available for processing of the digital image has made a very general technique of image processing and communally used because it is less expensive and more flexible.

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