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Image Processing - A Quick Survey

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Abstract: ***In the Image process associated type of signal processor, the input is a digital image; the output of the image process is either a picture or a group of characteristics or parameters associated with the image. Most image-process techniques involve treating the image as a two-dimensional signal and applying commonplace signal-processing techniques. Image process has developed in the Sixties, and 2000 digital image process has become the only common type of image process thanks to its skillfulness and low price. The Image process is split into two major branches in a broader sense: image sweetening and image restoration. Fourier remodels the hottest image transforms. The Fourier remodel has been employed in a vast selection of applications. The image process is that the act of examining pictures for distinctive objects and decision making their significance. A picture analyst studies the remotely perceived knowledge and conceives to discover, identify, classify, live, and judge the importance of physical.***

Keywords: image, image recognition, videos processing

1. Introduction

Digital Image is composed of a finite number of elements, each of which elements have a particular value at a particular location. These elements are referred to as picture elements, image elements, and pixels. A Pixel is most widely used to denote the elements of a Digital Image. When the spatial coordinates and the intensity values are finite with discrete quantities then it is called as image processing. The digitized images can be easy to study and handle in order to improve the quality with the use of some mathematical calculations. Here the image is given as an input, parameters of an image as processed through method and attribute related to the images as an output. Image Processing (IP) is the process of images through various algorithms. This image processing has been working in number of areas such as pattern recognition, remote sensing, image-sharpening, color, and video processing and medical. This paper has been organized as follows, literature part explains various review of authors and discusses about the various applications in Digital Image Processing (DIP)

2. Review of Literature

RanuGorai discussed about how the image and picture are defined in our daily life and clearly explained about three methods such as sharpening the edges, noise removal and removing the motion blur for an image [1]. Jangala Sasi Kiran et al., proposed an algorithm to improve the overall accuracy of the hand written character under pattern recognition field using image processing techniques like feature extraction, image restoration and image enhancement [2]. B Thamotharan Ed al, proposed that the digital image processing concepts are done by different algorithms and highlighted noise and edge detection algorithm. He discussed another two concepts like mean and median filtering for radiographic images and compared them [3]. Shafiqua T. Pathan Ed al, proposed that this paper mainly focusing on the security-based system by modern digital image processing also this paper gives a way to process a video from variety of video devices. First set the continuous frames from the videos then it had been processed under SUSAN for extracting the features [4]. Dipen Saini exposed about the data clustering for clustering of objects. A specific algorithm is used for group detection from an image using distance metrics through linear features [5].

Applications in digital image processing

Since digital image processing has generally applied in many applications and almost all the technical fields are affected. Digital Image processing is not just bounded to adjust the spatial resolution of the everyday images captured by the camera. It is not just limited to extension the brightness of the photo. Electromagnetic waves can be thought of as stream of particles, where each particle is moving with the speed of light. Each particle contains a bundle of energy. This bundle of energy is called a photon. In this electromagnetic spectrum, we are only able to see the visible spectrum. Visible spectrum mainly includes seven different color that are commonly term as (VIBGOYR). VIBGOYR stands for violet, indigo, blue, green, orange, yellow and Red. But that does not nullify the existence of other stuff in the spectrum. Our human eye can only see the visible portion, in which we saw all the objects. But a camera can see the other things that a naked eye is unable to see. For example: x rays, gamma rays, etc. Hence the analysis of all that stuff too is done in digital image processing [9]. Some of the major Application fields in which digital image processing is widely used are mentioned below Image sharpening and restoration Image sharpening and restoration refers to process images that have been captured from the modern camera to make them a better image or to manipulate those images in way to achieve desired result. It refers to do what Photoshop usually does. This includes Zooming, blurring, sharpening, gray scale to color conversion, detecting edges and vice versa, Image retrieval and Image processing

Medical field: The common applications of DIP in the field of medical is, gamma ray imaging, PET scan Ray Imaging, Medical CT, UV imaging. DNA analysis, fingerprint and facial recognition are evident applications of image processing.

UV-Rays: In the field of remote sensing, the area of the earth is scanned by a satellite or from a very high ground

and analysed to obtain information about it. One particular application of digital image processing in the field of remote sensing is to detect infrastructure damages caused by an earthquake. As it takes longer time to grasp damage, even if serious damages are focused on. Since the area effected by the earthquake is sometimes so wide, that it not possible to examine it with human eye in order to estimate damages. Even if it is very hectic and time-consuming procedure and found a solution in digital image processing. An image of the affected area is captured from the above ground and analyzed to detect the various types of damage done by the earthquake. Key steps include in the analysis are, the extraction of edges, Analysis and enhancement of various types of edges.

Transmission and encoding: The very first image that has been transmitted over the wire was from London to New York via a submarine cable. The picture took three hours to reach from one place to another. Now able to see live video feed, or live CCTV footage from one continent to another with just a delay of seconds. It means that a lot of work has been done in this field too. This field does not only focus on transmission, but also on encoding. Many different formats have been developed for high or low bandwidth to encode photos and then stream it over the internet.

Machine/Robot Vision: One of the biggest challenges still is to increase the vision of the robot. Developed a robot able to see things, identify them and identify the hurdles etc. Much work has been contributed by this field and still developing.

Hurdle detection: Hurdle detection is one of the common tasks that have been done through image processing, by identifying different type of objects in the image and then calculating the distance between Robots and hurdles

Tools and techniques in digital image processing tools: An Image Processing tools are the major evaluation part for developing, monitoring and making the images in proper consistencies. This will describe about the major functionalities occurring at the implementation of coding by the basis of certain algorithms.

Techniques

a) **Image editing**-This basically means altering digital images by means of graphic software tools.
b) **Image Restoration**-which refers to the estimation of a clean original image out of the corrupt image taken in order to get back the information lost.
c) **Independent Component Analysis**-which separates a multivariate signal computationally into additive subcomponents.
d) **Anisotropic Diffusion**-which is often known as Perona-Malik Diffusion, makes it possible to reduce image noise without having to remove important parts of the image.
e) **Linear Filtering**-It's another digital image processing technique, which refers to processing time-varying input signals and producing output signals that are linearity.
f) **Neural Networks**-which are computational models widely used in machine learning for solving various tasks.
g) **Pixilation**-which often refers to turning printed images into digitized ones (Such as GIF).
h) **Principal Components Analysis**-A digital image processes technique that can be used for extraction.

3. Conclusion

A large number of image processing applications, tools and techniques helps to extract complex features of an image. Image processing works on single dimensional image to multidimensional and see what actually in the image. Image processing is the real core for many developing technologies in the real time aspect. This paper discusses the overview of an image processing

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