Review Study on problems and challenges of various arts in Image DataProcessing and Big Data Analytics

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Abstract

Image processing, in the present-day domain, is now emerging as a new and an innovative space in computing research and applications. Today, the discipline of "computer science" may be termed as "image science", because in every aspect of computer application, either science or humanities or management, image processing plays a vital role in varied ways. It is broadly now used in all the industries, organizations, administrative divisions; various social organizations, economic/business institutions, healthcare, defence and so on. Image processing takes images as input and image processing techniques are used to process the images and the output is modified images, video, or collection of text, or features of the images. The resultant output by most image processing techniques creates a huge amount of data which is categorized as Big-data. The integration and interaction of the two broad fields of image data processing and Big Data have great potential in various areas. Research challenges identified in the integration and interaction of these two broad fields are discussed and some possible research directions are suggested.

Keywords: Images, Data Processing, Big data, Analytics.

Introduction

The technology of Image processing encompasses by highly utilizing the computer proficiency to analyze the digital images i.e. the images generated using a computer. Image processing is used in numerous ways in many of the important technological-related fields like Oceanography, currency recognition, Medical imaging, remote image transmission, fake- note deduction, Satellite imaging etc. The Digitized image is analyzed and manipulated to improve the image's eminence. Interestingly it is worth noting that many of the image processing techniques were involved in separating the distinct color levels of the images and making them into two-dimensional signals. Image processing is also used for processing those distinct color levels into three-dimensional signals with the third-dimension. The resultant signals or features extracted by processing the images are analyzed to incur some knowledge and take decisions.

Different kinds of techniques are currently used in the fields of image processing and Big Data analytics. However, the interaction and integration of the two broad fields need more insight to better explore and exploit the benefits of the two techniques. Thus, the present study aims to focus of the recent research

progresses in the two broad fields of image processing and Big Data analytics to bring out the importance of their interaction and integration. Image processinginvolves applying computing techniques to processing images. Images are taken as input and the properties of the images are changed to enhance the image or features are extracted to make them less complex to study. The following section gives an overview of different image processing techniques.

Image processing
Image Processing is a method to improve basic images got from cameras/sensors put on satellites, space tests and air ships or images taken in ordinary everyday life for different applications. Different systems have been produced in Image Processing amid the last four to five decades. A large portion of the procedures are produced for improving images got from unmanned shuttles, space tests and military observation flights. Image Processing systems are getting to be famous because of simple accessibility of capable work force PCs, substantial size memory gadgets, illustrations programming's and so forth.

Image processing techniques

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Image restoration
Image restoration is to clear noise and recover the resolution loss. Otherwise, we say that image restoration recovers the original image from a given degraded image. Software used image restoration Adobe Photoshop, CS3 Extended, GIMP, Paint and NET.

Retrieval of images
The process of retrieving the image in a huge database system is referred as Image retrieval. Different searching techniques in-volved in this area such as Content-based Image Retrieval, Con-tent-based Visual Information Retrieval, Document- based Image Retrieval.

Image recognition
Image recognition is nothing but recognizes the image object. For example: Consider the collection of images as an input and the output is to recognize the object. Some of the open source soft-ware is used to recognize the image.

Image enhancement
Image enhancement is different from the process of restoration of images. Image Enhancement's principal aim is to give an excellent image with high quality. The more enhancement concepts are sometimes called as image editing. E.g., filtering, contrast adjustment, de-blurring, morphological etc.

Image pre-processing
The techniques of pre-processing of Images are generally categorized into two basic categories such as
- Static Thresholding and.
- Dynamic Thresholding.

As like the Image Enhancement, the method of Image pre-processing largely involved in the process of enhancing the images by modifying the pixel values either its brightness or its contrast for its visual impact which may be occurred due to blurriness which capturing from low conventional/digital cameras or from the im-ages obtained from the satellite pictures.

Apart from the above techniques of image processing, various new and advanced systems of image processing using Big Data tools are also in use. An organization can be handling their multitasking challenges, build their enterprise data hub, content management, managing their open source data, etc. by using those Big Data tools.

Usage of big data
Big Data is one of the effective fields in the existing data handling system. This field includes data, images, and videos. For the subsequent utilization of Big Data to a greater extent, one can prefer to use Big Data

analytics. Commonly Analytics is implemented in both structured and unstructured data. In fact, nowadays it is more helpful for the business peoples, Healthcare institutions and Military organizations to analyze the hidden pattern as well as to know the un-known correlation. The big sizes of images used in Big Data and data analytics are together called as Image data analytics.

REVIEW OF LITERATURE

Minakshi Kumar (2009) concentrated on the fundamental mechanical parts of Digital Image Processing with unique reference to satellite image processing. Essentially, all satellite image preparing operations can be assembled into three classifications: Image Rectification and Restoration, Enhancement and Information Extraction. The previous manages beginning processing of crude image information to redress for geometric contortion, to adjust the information radio metrically and to wipe out commotion display in the information. The improvement methods are connected to image information keeping in mind the end goal to viably show the information for resulting visual translation. It includes systems for expanding the visual refinement between elements in a scene. The goal of the data extraction operations is to supplant visual examination of the image information with quantitative strategies for robotizing the distinguishing proof of components in a scene. This includes the examination of multispectral image information and the utilization of measurably based choice guidelines for deciding the land cover personality of every pixel in a image. The purpose of characterization
process is to arrange all pixels in an advanced image into one of a few land cover classes or subjects. This characterized information might be utilized to deliver topical maps of the land cover display in a image.

Ashraf A. Aly (2011) assessing the past work is a critical piece of creating division strategies for the image examination systems. The point of this article is to give a survey of advanced image division systems. The issues of advanced image division speak to incredible difficulties for PC vision. The extensive variety of the issues of PC vision may make great utilization of image division. This paper thinks about and assesses the diverse strategies for division methods. We talk about the fundamental propensity of every calculation with their applications, focal points and hindrances. This study is helpful for deciding the proper utilization of the image division techniques and for enhancing their precision and execution furthermore for the primary target, which outlining new calculations.

Jai Prakash (2014) image processing is a type of flag preparing in which the info is a image, for instance, a photo or video and as yield we get either a image or an arrangement of qualities comparing to the image. Image preparing can likewise be characterized as a method for transformation between the human visual systems and computerized imaging gadgets. A legitimate investigation of run of the mill Image preparing systems is finished. All parts of Image preparing, their application and interrelations between them are altogether analyzed i.e., input gadgets, yield gadgets and programming, its application, the ebb and flow inquire about going on Image Processing and its need later on.

DISCUSSION

It is found that the available sources in relation to image processing and data analytics are hardly done by the earlier scholars. As discussed above, Elakkia and Narendran (2016), Yao (2017) studied about various image processing techniques for image matting and image segmentation, remove the Gaussian Noise, control the automatic traffic signal and to maintain the healthcare systems. Himmi et al. (2017), Paulchamy et al. (2017), Hu et al. (2014) discussed highly using of Big Data Analytics and its tools. Most of the authors are supported the Hadoop and Map Reduce tools. These tools helped the business people consider as well as to create automated tools for changing business models. These two areas are most helpful for present-day computer world. How-ever, most of the researchers are not attempted to analyse about these data analytics with the combination of image processing. Therefore there is a lag in this field that leads to a research gap are combining image processing techniques and data analytics.

The present study reveals that some of the following gaps are found in the above-discussed survey and those gaps should be filled with by identified or finding the suitable solutions with the help of the existing experts of this field for the future prospects.In future precocious Hadoop tools should be developed. Even though adaptive and accurate mechanisms have been applied to extract and recognize the content of traffic sign on

the above studies, it should be further developed for its betterment. Besides, the medical image of the anatomical structure can-not be used so far in the medical field. Therefore some possible future studies will be made to find the better computational time. A better machine learning concept should be developed and implemented for reducing noisy, imbalance data and missing values in the forthcoming days.

CONCLUSION

This survey comprised of three broad sections in which the state of the art in image processing was dealt in first section, and the state of the art in Big Data analytics was dealt in the second section and finally in the third section, the combination of the two broad fields of image processing and data analytics from the features or data extracted from these images into a single efficient system for better applications and decision making was discussed extensively. We may also this application in future for identifying the unidentifiable diseases in vegetables, fruits which may help the farmers and agriculturalists. However, so far no at-tempt has been made to analyze the features extracted from the image for gaining better knowledge from the image data in the review so far. There are other more applications of Big Data for the betterment of humankind. Hence Big Data analytics is critical for mankind. For images that did not have a similar light conditions and were turned generally to each other, all matches were found with the third size of the a trouswavelet calculation. Since the technique was extremely tedious in calculation, specialist have restricted this test to the 49 cartridge cases, and contrasted them with each other.

The study inferred that if images are entered in the database utilizing a standard convention, a straightforward calculation of the standard deviation of the distinction of the image is practical.

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