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**ABSTRACT**

Image segmentation is the process of partitioning an image into multiple segments, so as to change the representation of an image into something that is more meaningful and easier to analyze. Several general-purpose algorithms and techniques have been developed for image segmentation. Several image segmentation techniques like edge detection, region based segmentation, thresholding and neural network techniques etc. are used. After performing these approaches, the resultant segmented image becomes a collective pixel set of the entire image. In this paper review image segmentation is explained by using different techniques.

**KEYWORDS:** MRI, Threshold, Segmentation, Clustering, Sobel, etc.

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**INTRODUCTION**

The image segmentation is an important technique in the field of digital image processing technology. Image processing or image analysis is a method to convert an image into digital form and perform some operations on it, in order to get an improved image or to extract some useful information from it. The purpose of image segmentation is to partition the image into essential with respect to the appropriate locations. For the segmentation we need the Images. But the images are either in form of black and white or colored. Color images are due to the grey level. When grey level contrast changes, color of the colored image also changes. The image segmentation plays important role in segmentation of medical images. The medical images play vital role in assisting health care which provides health care access to patients for treatment. Digital image segmentation is an important and recent domain in computer history and digital image processing. It is a type of signal dispensation in which input is image, like video frame or photograph, satellite imagery and output may be image or characteristics associated with that image.

Image segmentation is an important element in many signal processing techniques and its applications. Segmentation technique is to discover the higher positions of the shape factors consistent with the advent records. The algorithms based on classifiers were extensively applied to phase organs in medical photos like as cardiac and mind photos. Intention of image segmentation manner is partitioning the photo into regions. The photograph segmentation packages figure out gadgets in a scene for totally item-based measurements together with size and form, an figuring out items in a shifting scene for object-based totally video compression, figuring out gadgets which can be at one of a kind distances from a sensor using intensity measurements from a laser variety finder enabling path planning for cell robots. Motive of image segmentation is to cluster pixels of an photo into photograph areas [1].

**IMAGE SEGMENTATION**

Image segmentation refers to the process of partitioning a digital image into multiple segments set of pixels. Pixels in a region are similar in according to some homogeneity criteria such as colour, intensity or texture. These pixels locate and identify the objects and boundaries in an image [1]. Practical application of image segmentation ranges from filtering of noisy images, medical applications (Locate tumors and other pathologies, Measure tissue volumes, Diagnosis, Treatment planning, Computer guided surgery, study of anatomical structure), Locate objects in satellite image, Face Recognition, Finger print Recognition, etc. Many segmentation methods have been proposed in the literature. Choice of a segmentation method over another and the level of segmentation are decided by the particular type of image and characteristics of the problem being considered.

## RELATED WORK

Many researchers have been done significant work in the field of dealing with the design of Image segmentation problems. Some of the work is described in this paper.

**Andrew J. Asman et al.**, has done study in the paper titled image segmentation of the spinal cord's internal structure. The method of differentiating and localizing the spinal cord's internal structure is critical for assessment of therapeutic impressions and determining prognosis of relevant conditions. Magnetic resonance imaging sequences enable clinical study of the spinal cord's internal structure and low contrast-to-noise ratio, artifacts, and imaging distortions have limited the applicability of tissue segmentation techniques pioneered elsewhere in the central nervous system. Herein, we present a novel slice-based groupwise registration framework for robustly segmenting cervical spinal cord MRI[2].

**Rajiv Kumar et al.**, In this paper the process of image segmentation is defined as the technique via which segmentation of a given photograph is done into various parts so that we can further analyze every of these components present in the photo. In the paper, author states that it is possible to extract some records via analyzing them and this statistics is useful for excessive-stage gadget vision software. There are numerous scheme of photograph segmentation to be had in literature. The analysis is done to examine the discontinuity-primarily based approach for photo segmentation. The discontinuity based totally segmentation structure may be categorised into 3 techniques: factor detection, line detection, and aspect detection. Simulation result of these numerous strategies is analyzed in MATLAB by the use of IPT. The author additionally enforces the unique part of operators inclusive of Prewitt, LoG, Roberts, Canny and the consequences of these operators can be shown on diverse pics[3].

**RohanKandwal et al.**, In this paper, image segmentation is noted as the maximum important part in digital picture processing. Segmentation is nothing but however a portion of any photo and object. In image segmentation, digital photo is splitted into a couple of set of pixels. Image segmentation commonly requires to cut out the region of interest (ROI) from the photograph. Currently, there are many distinct algorithms to be implemented for photograph segmentation. Each has their very own benefits and motives. In this paper, the author has reviewed different image segmentation algorithms with their possibilities[4].

**Hakeem AejazAslam et al.**, In his paper, the author offers a new method to picture segmentation by the usage of an algorithm. This algorithm has a reach set of rules and is known as Pillar k-means algorithm. Segmentation technique includes a new mechanism for grouping the factors of high resolution pictures so that you can increase accuracy and decrease the computation time. The system uses k-way for image segmentation optimized by means of the set of rules after Pillar. Pillar algorithm considers the location of pillars must be located as a long way from every other to face up to the pressure distribution of a roof, as equal as the range of centroids between the information distribution. This set of rules is able to optimize the k-mean clustering for photo segmentation in the aspects of accuracy and computation time. In this, set of rules allocates all initial centroids in line with the most cumulative distance metric. In this paper a new technique for image segmentation is developed that compares the results of K-mean algorithm with Gaussian aggregate model. Experimental consequences clear the effectiveness of our approach to improve the segmentation satisfactory and accuracy factors of computing time[5].

**Yongjing Wan et al.** presents that Image edge detection is sensitive to noise which is naturally contained by images. Therefore it affects the quality of the picture partition. In order to remove noise and improve edge detection accuracy, improving the quality of picture segmentation, a novel image segmentation algorithm via neighborhood the main section analysis and Laplace operator is proposed. The featured vectors of each pixel are extracted through the main section analysis to get the main component, which effectively suppresses noise. Then the Laplace operator is used to detect the edge to realize the image segmentation. Compared to the traditional image segmentation of Sobel operator and LOG operator, the algorithm is proposed to estimate the parameter values by principle component analysis, instead of depending on experience. It can effectively decrease the noise on the image interference and simplify the computational complexity. Experimental results demonstrate that the algorithm can effectively improve the segmentation of the picture with a strong advantage in the accuracy and robustness [6].

**Sukhdeep Kaur et.al.**, in this paper the author has proposed, Analysis of Various Image Segmentation Techniques Using MATLAB. The purpose of image segmentation is to partition an image into meaningful regions with respect to a particular application. The segmentation is based on measurements taken from the image and might be grey level, colour, texture, depth or motion. The logarithm operator method shows that an image can be compressed by replacing each pixel value with its logarithm. The output from watershed transformation technique shows that we can separate two merged objects and can analyze it in the best manner. The wavelet transform technique help us to analyze horizontally, diagonally, and vertically two dimensional views of an image[7].

**DibyaJyoti Bora et al.**, In this paper image segmentation is stated as a vast topic of research and choice of large number of researchers by the author. The reason for the popularity of image segmentation is because of its importance in the area of image processing and computer vision. The prime task of the researchers working in the field is to develop a method for efficient and better image segmentation. The segmentation which is done using approaches of clustering is considered good for image segmentation. The advantage of using approaches of clustering in image segmentation is that this is a wide area and can be employed in other areas of engineering too. In this paper the author has developed a new technique for image segmentation keeping clustering as base. K-mean algorithm is employed and distance parameter is considered for deciding the performance. The distance measure “cosine” is employed in this paper. Sobel filter is then used for filtering and the results are obtained using Marker Watershed algorithm. The performance parameters that are taken into consideration by the author in this paper are Mean Square Error and PSNR[8].

**Khang Siang Tan et al.**, In this paper a new histogram thresholding fuzzy C-method hybrid (HTFCM) approach is presented that would find distinct software in sample popularity. In addition, in laptop imaginative and prescient, particularly in shade photo segmentation. The histogram thresholding approach that is proposed in the paper is employed to acquire all feasible uniform regions within the coloration photograph. Then, the bushy C-manner algorithm is applied in the uniform regions while cluster formation and that will enhance the compactness of the formed clusters. Experimental outcomes have confirmed that the low complexity of the proposed HTFCM technique should acquire better cluster satisfactory and segmentation consequences than other segmentation techniques that employing any colony set of rules[9].

## CONCLUSION

In this survey paper various methods of image segmentation are studied, the summary of diverse segmentation techniques applied on digital image processing is enlightened shortly. The paper also evaluates variety of research techniques applied on image segmentation. The papers on image segmentation have been studied and reviewed in the paper. There are certain factors that affect the process of image segmentation like the intensity of image to be segmented, color, type and the noise present in the image. The algorithm development for effective image segmentation is still a big research that will take place in the area of image processing.

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