## A NOVEL IMAGE SEGMENATATION TECHNIQUES

**SK.AREEFA BEGUM ASSISTANT PROFESSOR, DEPT.OF ECE, GDMM COLLEGE OF ENGINEERING AND TECHNOLOGY A.P, INDIA**

**J.SHARON ROSE VICTOR ASSOCIATE PROFESSOR, DEPT.OF ECE, GDMM COLLEGE OF ENGINEERING AND TECHNOLOGY A.P, INDIA**

**Abstract**

The process of image segmentation is defined as the technique via which a given photograph is segmented into several parts in order to further analyze every of these components present in the photo [9]. In segmentation, without a doubt image is represented into greater understandable form. Segmentation essentially used to hit upon the gadgets, obstacles and other applicable facts in the digital snap shots. There are exceptional tactics to enforce segmentation like threshold, clustering and remodel strategies etc [10]. The reason for the popularity of image segmentation is because of its importance in the area of image processing. The prime task of the researchers working in the field is to develop a method for efficient and better image segmentation. 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 [12]. No algorithm has been developed till date that could keep a look at all the above listed factors and then segment the image effectively so that all the problems that can come in the way of image segmentation can be avoided. The algorithm development for effective image segmentation is still a big research that will take place in the area of image processing. Researchers still have to go a long way to develop efficient algorithm for image segmentation [12]. This paper presents a review of some of the algorithms developed for image segmentation.

Keywords— Image processing; K-mean clustering; segments; computer vision; ROI; image pixels

## I. INTRODUCTION

DIP or Digital Image processing is crucial area for lots motives. Honestly digital picture processing is a recent problem in pc records. In Nineteen Sixties; Bell Labs and college of Maryland, and some different places commenced to broaden several techniques for digital image processing [20]. With application to satellite imagery, medical imaging, character popularity, and image enhancement and many others [20]. But the price of processing changed into pretty excessive with the computing system of that era. Inside the Nineteen Seventies, photograph processing proliferated, whilst

cheaper computers and devoted hardware became available. Pictures ought to then be processed in real time, for a few committed troubles which includes tv requirements conversion. In digital photo processing, we use computer algorithms to perform picture processing. Truly DIP has several benefits over the analog image processing; first it gives a high variety of algorithms to be used with the enter information, 2d we will keep away from some processing troubles which includes developing noise and sign distortion at some stage in sign processing. In 2000s, speedy computers have become to be had for sign processing and virtual image processing has grow to be the popular form of picture processing. because of that, sign picture processing have become flexible approach, and additionally cheapest [20]. Image segmentation is important element in many sign processing method and its applications. The segmentation technique is to discover the higher positions of the shape factors consistent with the arrival records. Algorithms based on classifiers were extensively applied to phase organs in medical photos like cardiac and mind photos. The intention of image segmentation manner is partitioning the photo into regions. photograph segmentation packages figuring out gadgets in a scene for item-based totally measurements together with size and form, 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. The motive of image segmentation is to cluster pixels of an photo into photograph areas [20]. Well-known techniques of image segmentation which can be still being used by the researchers are side Detection, Threshold, Histogram, region based totally methods, and Watershed Transformation. Since pictures are divided into two types on the idea of their color, i.e. gray scale and shade photographs. Consequently image segmentation for coloration pictures is absolutely exclusive from gray scale images, e.g., content based totally image retrieval. Additionally which set of rules is robust and works properly is depends at the form of picture [3]. The assets of a pixel in an image and statistics of pixels close to that pixel are two fundamental parameters for any image segmentation algorithm. it may additionally be representing as similarity of pixels in any location and discontinuity of edges in image. part based segmentation is used to divide photo on the idea of their edges. region primarily based techniques used the edge in order to separate the historical past from an picture, while neural network primarily based techniques used the gaining knowledge of set

## II.   TECHNIQUES OF IMAGE SEGMENTATION

Various techniques have been developed for the task of image segmentation. The image is segmented into numbers of parts so that it could be analyzed easily [9] and the objects in the image could be

recognized. The table below shows the comparison of various image segmentation techniques and their advantages and disadvantages have been listed in the table.

Table 1 Various Segmentation Techniques With Their Advantages &Disadvantages[20]

| Sr No. | Name of Technique | Advantages | Disadvantages |
|---|---|---|---|
| 1 | Inverse dynamics method | This algorithm employs a non-linear optimizer.Data extraction is done in fair manner.Better quality animation is achieved | The different patterns of EMG received can give identical output. |
| 2 | Pattern Recognition method | Segmentation is done using pattern recognition.The link amid inputs & outputs are modeled using this algorithm | Shape parameters of the algorithm are restricted.Complexity of algorithm is high |
| 3 | Topological alignments method | The efficiency of filtering is increased.Linkage clustering algorithm is employed in the algorithm | High complexity |
| 4 | Novel edge-based method | The basis for this segmentation algorithm is procedure of minimization of energy | The dislocation & progression of the segmented objects amid objects is assumed to be small. |
| 5 | Threshold method | The edges are found by eliminating the noise in the image.The pixels of edges are located by using gradient magnitude. | Edges located or detected can be discontinuousCost of thealgorithm is high |
| 6 | Active contour method | This algorithm employs active contour models.The shapes of lines are preserved effectively | Need to locate firm image gradients.Lesser accuracy.Uncertain image boundaries |
| 7 | Watersheds Method | The basis for this algorithm is mathematical morphology.The capture range is improved | Segmentation is done at high scale |

## III.  RELATED WORK

DibyaJyoti Bora et al. (2014) [7], 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 done using approaches of clustering are 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 a 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. Rajiv Kumar et al. 2011 [9], In this paper the process of image segmentation is defined as the technique via which we segment a given photograph into several parts in order that we can further analyzed every of these components present in the photo. The 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 techniques of photograph segmentation to

be had in literature. In this paper, analysis is done to examine the discontinuity-primarily based approach for photo segmentation. The discontinuity-based totally segmentation may be categorised into 3 techniques: factor detection, line detection, and aspect detection. The result of these numerous strategies is analyzed in MATLAB the use of IPT. The author additionally enforce the unique part operators inclusive of Prewitt, Roberts, LoG, Canny and the consequences of these operators can be shown on diverse pics. Hakeem AejazAslam et al. (2013) [1], In this paper the author offers a new method to picture segmentation the usage of Pillar okay-approach set of rules and the algorithm defined using that set of rules is known as Pillar k-mean s algorithm. This segmentation method includes a new mechanism for grouping the factors of high resolution pictures so that you can improve accuracy and decrease the computation time. The system uses k-way for image segmentation optimized by means of the set of rules after Pillar. The 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. This set of rules distributes 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 make clear the effectiveness of our approach to improve the segmentation satisfactory and accuracy factors of computing time Khang Siang Tan (2011) et al. [4], 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 to 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 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 ant colony set of rules. AmanpreetKaur et al. (2012) [10],In this paper, image segmentation is described as in which we divide the image into a couple of components in the form of pixels. In segmentation, without a doubt image is represented into greater understandable form. Segmentation essentially used to hit upon the gadgets, obstacles and other applicable facts in the digital snap shots. There are exceptional tactics to enforce segmentation like threshold, clustering and remodel strategies etc. After appearing these processes, the ensuing segmented image is a collective pixel set of the complete photo. Pixels within the image corresponds to some characteristics of picture like shade, texture and so forth. Muhammad Waseem

Khan et al. (2014) [11], In this paper the author states that image segmentation is an integral part of image processing. The author says that the steps of image segmentation are necessary when it comes to area of image processing. The task of image segmentation is dividing the image into numbers of regions so that image could be analyzed easily. The numbers of objects in the image are also recognized easily when segmentation of image is done. To ease the process of evaluating and analyzing images various image segmentation techniques have been developed till date. In this paper the author has reviewed the techniques that have been developed till date for image segmentation and has also developed a new technique for image segmentation using the recent technology.  RohanKandwal et al. (2014) [12],  In this paper, image segmentation is noted as the maximum important part in digital picture processing. Segmentation is nothing however a portion of any photo and object. In image segmentation, digital photo is split into a couple of set of pixels. Image segmentation is commonly required to cut out region of interest (ROI) from an photograph. Currently there are many distinct algorithms to be had for photograph segmentation. Each have their very own benefits and motive. In this paper, the author has reviewed different image segmentation algorithms with their possibilities.

## IV.   CONCLUSION

Image segmentation is of utmost importance in the area of image processing and computer vision [12]. In this an image is divided into multiple segments for analyzing the image [4]. Numbers of techniques and algorithms have been developed for image segmentation. This paper presents a review of various image segmentation techniques. Few papers on image segmentation have been studied and reviewed in the paper. None of the developed techniques has been developed universally for image segmentation [12]. Since, new algorithms are being developed everyday to improve efficiency of segmentation. 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 [12]. No algorithm has been developed till date that could keep a look at all the above listed factors and then segment the image effectively so that all the problems that can come in the way of image segmentation can be avoided. The algorithm development for effective image segmentation is still a big research that will take place in the area of image processing. Researchers still have to go a long way to develop efficient algorithm for image segmentation.

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