

[Chapter](#) [PDF Available](#)**An Experiment with Statistical Region Merging and Seeded Region Growing Image Segmentation Techniques**

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Kamla Nehru Mahavidyalaya, Nagpur**Pankaj Agrawal**[Download full-text PDF](#)[Download citation](#)[Copy link](#)[Citations \(4\)](#)[References \(41\)](#)[Figures \(6\)](#)**Abstract and Figures**

This paper puts forth our observations from the experiments conducted on interactive segmentation techniques - Statistical Region Merging and Seeded Region Growing, both based on Region Growing methods, using Matlab software on selected natural images. Both these techniques meant to solve segmentation challenges posed by medical images and were effective as well; however, in this experiment, we have subjected natural images to these techniques to assess the effectiveness. We have chosen the images such that those have complexities and pose segmentation challenges. The objective of this experiment is to understand and assess the effectiveness of these techniques on select natural images, which have complex image composition in terms of intensity, color mix, indistinct object boundary, low contrast, etc. We have used Jaccard Index, Dice Coefficient and Hausdorff Distance as measures to assess the accuracy, besides visual assessment. We have compared the segmented images with ground truth using these accuracy measures. While both the techniques failed to give acceptable results on most of the images, relatively, we have found Statistical Region Merging to be slightly better than Seeded Region Growing method.



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## An Experiment with Statistical Region Merging and Seeded Region Growing Image Segmentation Techniques

# Segmentation Techniques

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**Abstract.** This paper puts forth our observations from the experiments conducted on interactive segmentation techniques - Statistical Region Merging and Seeded Region Growing, both based on Region Growing methods, using Matlab software on selected natural images. Both these techniques meant to solve segmentation challenges posed by medical images and were effective as well; however, in this experiment, we have subjected natural images to these techniques to assess the effectiveness. We have chosen the images such that those have complexities and pose segmentation challenges. The objective of this experiment is to understand and assess the effectiveness of these techniques on select natural images, which have complex image composition in terms of intensity, color mix, indistinct object boundary, low contrast, etc. We have used Jaccard Index, Dice Coefficient and Hausdorff Distance as measures to assess the accuracy, besides visual assessment. We have compared the segmented images with ground truth using these accuracy measures. While both the techniques failed to give acceptable results on most of the images, relatively, we have found Statistical Region Merging to be slightly better than Seeded Region Growing method.

**Keywords:** Statistical Region Merging · Seeded Region Growing · Interactive segmentation · Effectiveness

## 1 Introduction

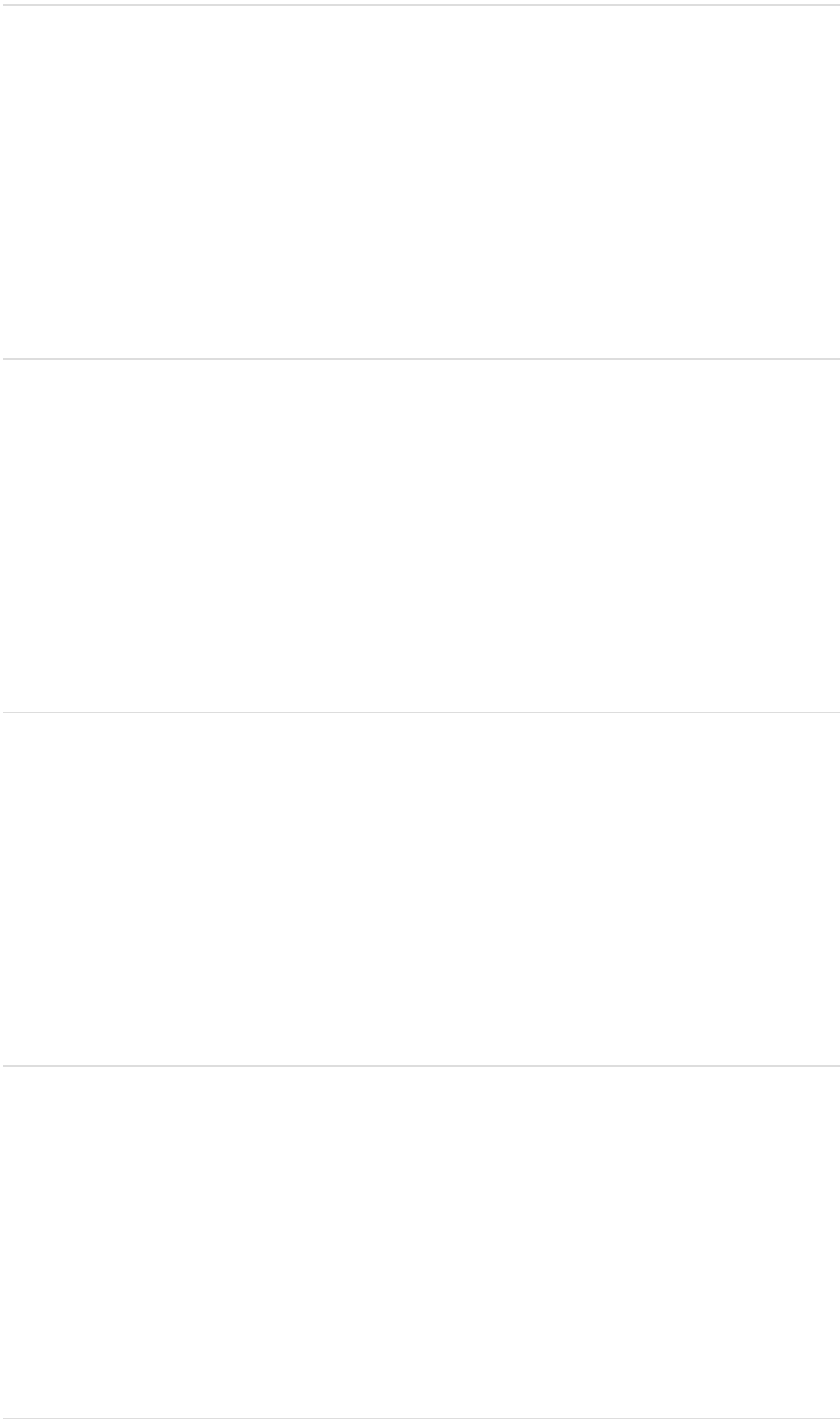
### 1.1 Background

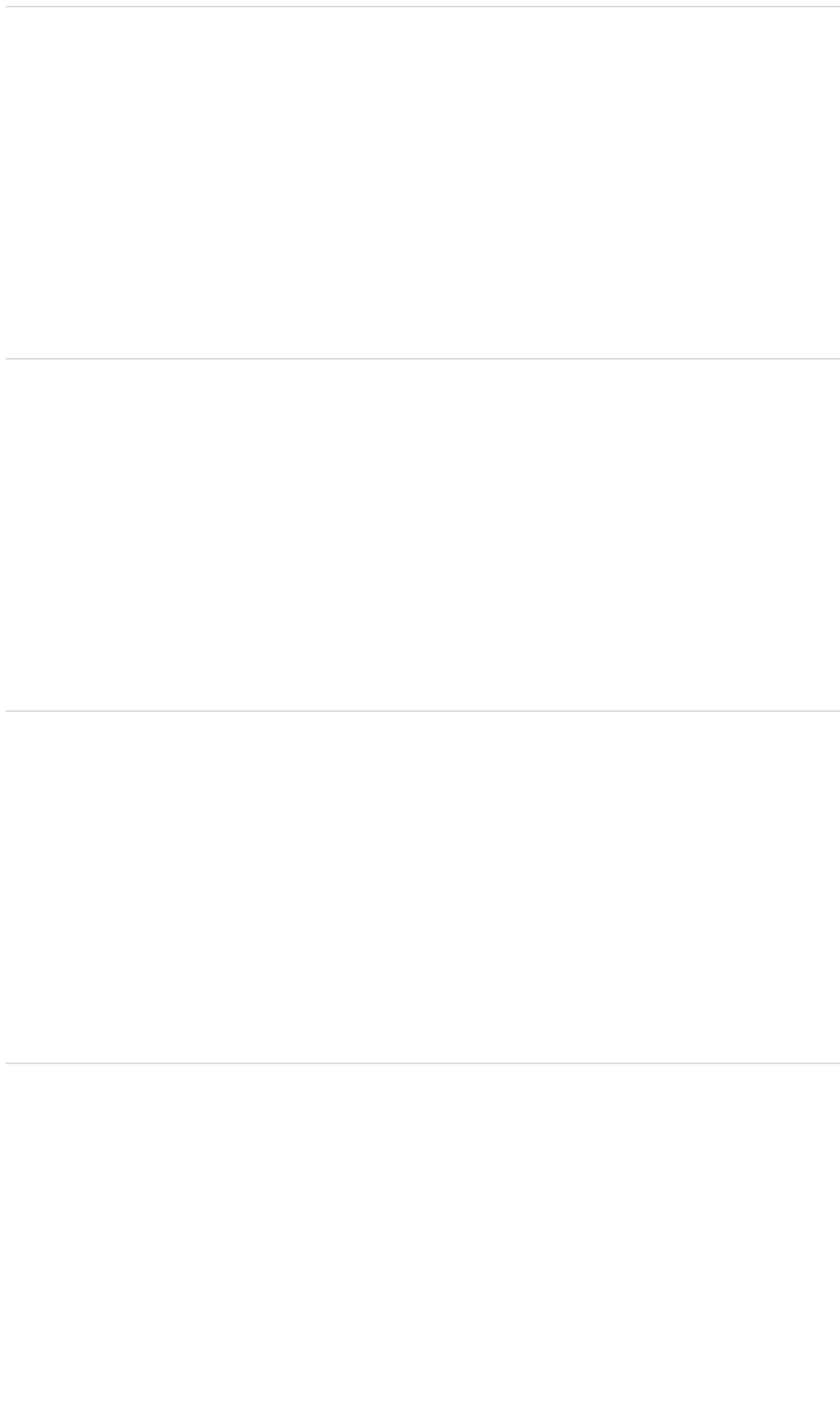
Image segmentation is about extracting foreground or object of interest from background and image segmentation has been a challenge ever since the need came into existence. The purpose or application behind each segmentation need has been different and hence different algorithms; each suitable for the specific purpose. Since about last

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... Numerous image segmentation algorithms have been developed in the literature, from the earliest methods, such as thresholding [6], region growing [7, 8], k-means clustering [9], watersheds [10], to more advanced methods, such as power watershed [11][12][13], watershed-cut [14], mutex watershed [15], active contours [16,17], graph cuts [18][19][20][21][22], Markov random fields [23], and sparsity based methods [24]. The interested reader may refer to ([25] Section 2) for an exhaustive review of the literature regarding segmentation algorithms. ...

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September 2017 · Journal of Electrical and Computer Engineering

Huidong He ·  Xiaoqian Mao ·  Wei Li · [...] ·  Genshe Chen

The extraction and tracking of targets in an image shot by visual sensors have been studied extensively. The technology of image segmentation plays an important role in such tracking systems. This paper presents a new approach to color image segmentation based on fuzzy color extractor (FCE). Different from many existing methods, the proposed approach provides a new classification of pixels in a ... [\[Show full abstract\]](#)

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March 2011

Siyuan Chen ·  Henry S. Baird

Versatile algorithms for document image content extraction (DICE) were investigated in [1, 2, 3, 4]. That is, to extract the image layers that contain the contents of interests, such as handwriting, machine-print text, photographs and blank, etc. The DICE classifier based on tight ground truth data can delimit the regions of interests approximately. In this paper, taking the result of DICE ... [\[Show full abstract\]](#)

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## Pixel-Label-Based Segmentation of Cross-Sectional Brain MRI Using Simplified SegNet Architecture-Bas...

October 2018 · Journal of Healthcare Engineering

 Bijen Khagi ·  Goo-Rak Kwon

Using deep neural networks for segmenting an MRI image of heterogeneously distributed pixels into a specific class assigning a label to each pixel is the concept of the proposed approach. This approach facilitates the application of the segmentation process on a preprocessed MRI image, with a trained network to be utilized for other test images. As labels are considered expensive assets in ... [\[Show full abstract\]](#)

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## Image Segmentation Assessment from the Perspective of a Higher Level Task

August 2015

Mariela Atausinchi Fernandez ·  Rubens M Lopes ·  Nina S. T. Hirata

Image segmentation evaluation is usually performed by visual inspection, by comparing segmentation to a ground-truth, or by computing an objective function value for the segmented image. All these methods require user participation either for manual evaluation, or to define ground-truth, or to embed desired segmentation properties into the objective function. However, evaluating segmentation is a ... [\[Show full abstract\]](#)

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