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## SEGMENTATION ANALYSIS OF OPTICAL COHERENT TOMOGRAPHY IMAGE BY STATISTICAL METHODS



**Mohandass G And R Ananda Natarajan**

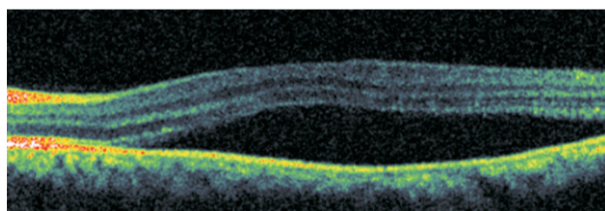
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**Abstract:** Optical coherent tomography image is an effective and efficient in diagnosis procedure in the retina. The challenge in OCT image is to detect retinal layers. Here, detection process in retina layers is a primary objective, such that, different existing segmentation methods is studied and analysed. For quality based analysis of the existing methods, the standard Statistical techniques are applied in output image. The result from the statistical techniques gives the relation of linear and similar methods, so that, narrow the objective by deriving and formulate a new procedure to evaluate this problem in segmentation of retinal Layers in OCT image.

**Keywords:** Optical coherent tomography; Segmentation analysis; Statistical techniques.

### I. INTRODUCTION

Optical coherent tomography (OCT) is an effective and new innovation technology of this decade. This image is detected by the optical induced of super luminous light into the layers of biological tissues.



**Figure 1: The effect of Central serous retinopathy diseases.**

These imaging's methods is mostly effective and used in the top most diagnosis identify procedure in the ophthalmology especially in retinal layers. There are multi-layers of retina, the diseases of different type effective the different layers of retina which causes the effects in the physiological function of the retina. In this work, figure [1], Central serous retinopathy (CSR) disease image is taken for analysis in the computation process such that the effective segmentation is identified based on the damaged layers.

The role of segmentation in OCT is most significant to identify the replication layer of CSR diseases. The segmentation is qualitatively analysis by statistical techniques. The OCT image of retina layers is purely based on the slight variation of threshold values [1-3]. This threshold values differentiate the multi-layers. The segmentation algorithm is chosen based on the computation process methods of threshold and intensity valued of pixels.

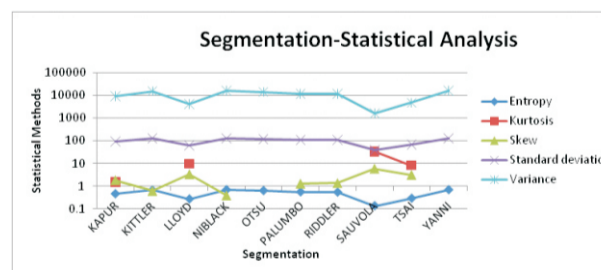
### II. COMPUTATION METHODS

The significant output of segmentation methods is validated by the statistical techniques. Based on the measure in statistical approach, the evaluations of effective segmentation methods are predicated. Kapur [4], Kittle [5], Lloyd [6], Niblack [7], Otsu [8], Palumbo [9], Riddler [10-11], Sauvola [12], Tsai [13] and Yanni [14] are the Segmentation methods, taken for studies and analysis of this work. This segmentation is operated and process by the computation approach in threshold values alone using the MatLab software. The output image is taken and valued by the statistical techniques.

The standard and well known statistical techniques are taken, that is, Entropy, Kurtosis, Skew, Standard Deviation and Variance [15-16]. The statistical techniques chosen here are standard and it have is own significant. In the mode of operation regarding the image of segmentation methods is to validation using standard statistical techniques.

### III. RESULT AND ANALYSIS

In the figure [2], the graphical output resembles the segmentation methods are validated by the statistical techniques.



**Figure 2: Statistical analysis in various Segmentation**

methods.

The output is linear and non-linear in the case of segmentation with respective the statistical techniques. Here the linear statistical techniques are Entropy, Skew and Standard deviation. Partially linear output is seen in Kurtosis. In Kurtosis, drastic change of values happens in Lloyd, Sauvola and Tsai segmentation methods. The non-linear output is seen in Variance alone.

In Entropy, highest value is Niblack and Yanni and Lower value is Sauvola. In Kurtosis, highest value is Sauvola and a Lower value is Riddler. In Skew, higher value is Sauvola and a Lower value is Yanni. In Standard Deviation, higher value is Niblack and Yanni and Lower values is Sauvola. In Variance, higher value is Niblack and Kittler and Lower values is Sauvola.

#### IV.CONCLUSION

The Optical coherent tomography is very important imaging methods for the diagnosis of retina images. In the retinal images, Multi-layers is differentiated by the small value in threshold values while computing. This lead the path to identify the threshold algorithm in segmentation methods. To evaluate the effective image output in segmentation methods, statistical techniques is applied to identify the linear similar methods. The analysis of image output is predicated by statistical techniques. The output of the segmentation is taken in MatLab tool, which can be identified that Nickel methods give variation of layer in retina. Thus, this can be extended for future studies by new and modified formulated computing procedure. The unwanted distortion is to be eliminated in the Nickel segmentation method.

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