

# A new and effective method for human retina optic disc segmentation with fuzzy clustering method based on active contour model

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Original Article

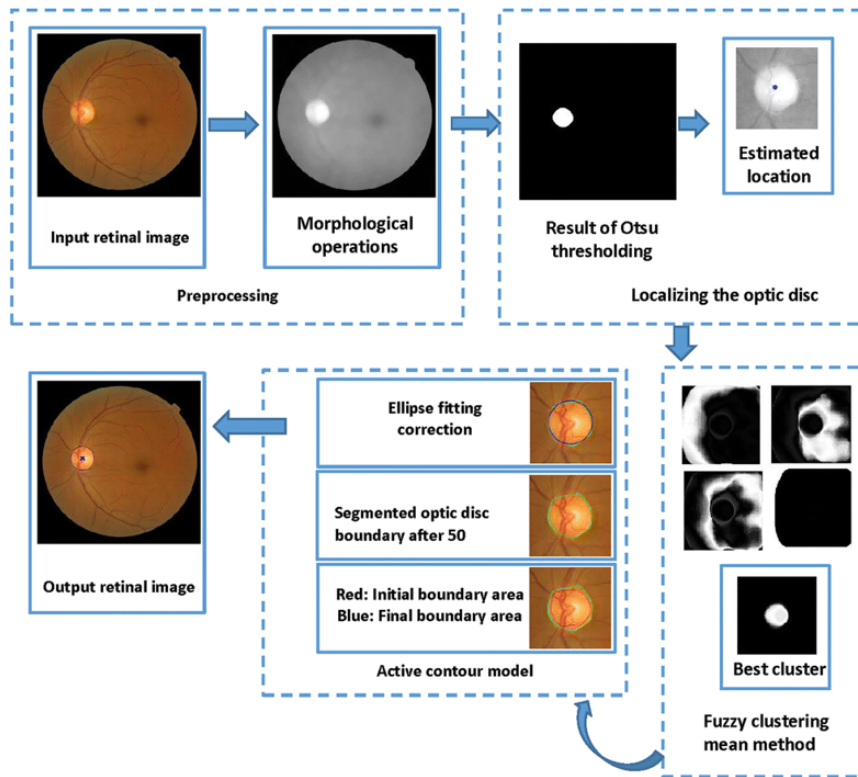
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## Abstract

In this paper, a new approach is proposed for localization and segmentation of the optic disc in human retina images. This new approach can find the boundary of the optic disc by an initial fuzzy clustering means algorithm. The proposed approach uses active contour model evolution based on a fuzzy clustering algorithm. The robustness of the proposed approach was evaluated with retinal imaging medical databases, such as DRIVE, STARE, DIARETDB<sub>1</sub>, and DRIONS. These bases contained images affected by different abnormalities, for example, diabetes, retinitis pigmentosa, and age-related macular degeneration AMD. A success detection rate with 100% accuracy was achieved for the DRIVE, DIRATEDB<sub>1</sub>, and DRIONS-DB databases, and 97.53% for the STARE database. For the optic disc segmentation, the method achieved an average accuracy and overlap in the range of 97.01–99.46% and 78.35–84.56% in these four databases. The result was compared with various methods in the literature, and it was concluded that the proposed method is more accurate than the other existing methods.

## Graphical Abstract



Graphical abstract

## Keywords

Retinal image analysis Optic disc Fuzzy clustering Active contour  
Optic disc segmentation

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## Notes

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## Compliance with ethical standards

## Competing interests

The authors declare that they have no conflict of interest.

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