

## Brainbow Image Segmentation Using Bayesian Sequential Partitioning

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**Abstract :** This paper proposes a data-driven, biology-inspired neural segmentation method of 3D drosophila Brainbow images. We use Bayesian Sequential Partitioning algorithm for probabilistic modeling, which can be used to detect somas and to eliminate cross talk effects. This work attempts to develop an automatic methodology for neuron image segmentation, which nowadays still lacks a complete solution due to the complexity of the image. The proposed method does not need any predetermined, risk-prone thresholds since biological information is inherently included in the image processing procedure. Therefore, it is less sensitive to variations in neuron morphology; meanwhile, its flexibility would be beneficial for tracing the intertwining structure of neurons.

**Keywords :** brainbow, 3D imaging, image segmentation, neuron morphology, biological data mining, non-parametric learning

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