

# An entropy-weighted local intensity clustering-based model for segmenting intensity inhomogeneous images

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## **Abstract**

This work proposes an entropy-weighted local intensity clustering-based model for segmenting intensity inhomogeneous images caused by the bias field. The variational model minimizes an energy functional consisting of a regularization term of the total length of object boundaries and a data-fitting term partitioning the image. Specifically, the total length is approximated by the convolution of the heat kernel with the characteristic functions of the segmented regions of interest. The data-fitting term is derived from the multiplicative bias field resulting in a local intensity clustering property and further weighted by the local entropy. One of the most advantageous features of the proposed model is that it can simultaneously segment the image and estimate the bias field for intensity inhomogeneity correction. Moreover, a simple and efficient iterative convolution-thresholding scheme can be applied to realize the model, exhibiting the energy-decaying property. Finally, numerical simulations are carried out to validate the superior performance of the approach. This is joint work with Wei-Ting Liao and Cheng-Shu You.