

# Fuzzy-based propagation of prior knowledge to improve large-scale image analysis pipelines

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## S4 Table: Abbreviations, parameters and descriptions of the segmentation algorithms.

Method	Parameters	Description
OTSU	$\sigma_{\text{smooth}} = 1$	Adaptive thresholding using Otsu’s method applied on a regularized raw input image [1].
OTSUWW	$\sigma_{\text{smooth}} = 1$	Same segmentation as OTSU. Merged regions in the entire image were split based on cleaned seeds of the LoGSM method, using a seeded watershed approach.
OTSUWW+U	$\sigma_{\text{smooth}} = 1,$ $\alpha_{21} = 0.1,$ $\beta_{21} = 0.1$	Same segmentation as OTSU. Small noise objects with FSMD values below $\alpha_{21} = 0.1$ were rejected from further processing. Merged regions with FSMD below $\beta_{21} = 0.1$ that were larger than expected were split locally and in parallel using the cleaned and fused seeds of the LoGNSM+F+U method and a seeded watershed approach in small cropped regions.
TWANG	$\sigma_{\text{grad}} = 3,$ $\sigma_{\text{kernel}} = 3,$ $\omega_{\text{kpm}} = 1.41$	TWANG segmentation as described in [2] using the cleaned seeds provided by the LoGSM method. The manually optimized parameter $\omega_{\text{kpm}} = 1.41$ yielded better results than the default value of 1.0 for this dataset.
TWANG+U	$\sigma_{\text{grad}} = 3,$ $\sigma_{\text{kernel}} = 3,$ $\omega_{\text{kpm}} = 1.41,$ $\alpha_{21} = 0,$ $\beta_{21} = 0$	TWANG segmentation as described in [2] using the cleaned and fused seeds provided by the LoGNSM+F+U method. $\alpha_{21} = 0, \beta_{21} = 0$ are adjusted such that all segments are propagated unchanged.

## References

1. Otsu N. A Threshold Selection Method from Gray-Level Histograms. *IEEE Transactions on Systems, Man and Cybernetics*. 1979;9:62–66.
2. Stegmaier J, Otte JC, Kobitski A, Bartschat A, Garcia A, Nienhaus GU, et al. Fast Segmentation of Stained Nuclei in Terabyte-Scale, Time Resolved 3D Microscopy Image Stacks. *PLoS ONE*. 2014;9(2):e90036.