

Resolving Clustered C-elegans via Shape Deformation Model

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The roundworm *Caenorhabditis elegans* is an effective model system for biological processes such as immunity, behavior, and metabolism. Recent progress in robotic sample preparation combined with automated microscopy and image analysis allows high-throughput screening experiments using *C. elegans*. Yet, typical phenomena such as interleaved and clustered worms, due to the high density in the imaged microplates, make the analysis of individual worms challenging.

We present a novel approach for the extraction of individual *C. elegans* from clusters that make use of the morphological properties of the worms. This is accomplished by the construction of a low-dimensional feature space that captures the worms' deformations and defining a probability measure on it. Worms' clusters are resolved by looking for partitions that maximize the sum of the posterior probabilities of the resulting segments. Promising segmentation results of high-throughput microscopic images are presented.