

Abstract Submitted  
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**An Integrated Method for Quantification and Analysis of Motility in *C. Elegans*** FRANK VAN BUSSEL, AMAR PATEL, Texas Technical University, Department of Mechanical Engineering, VENKAT PADMANABHAN, Indian Institute of Technology, Kharagpur, KHAN ZEINA, SIVA VANAPALLI, Texas Technical University, Department of Chemical Engineering, JERZY BLAWZDZIEWICZ, Texas Technical University, Department of Mechanical Engineering — Though the nematode *C. Elegans* is a model organism in many areas of biology, its most readily observed behaviors, crawling and swimming, have yet to be thoroughly described. The outcome of detailed studies, for example, on the relation of neural control to chemotaxis, or the effects of gene suppression as manifested in the behavior of mutant strains, depends upon the acquisition of detailed trajectory data over nontrivial time and length scales. Here we present a methodology for processing, quantifying, and analyzing nematode motion data both in terms of their shape over short time scales and their trajectories over long time scales. This method is based on a succinct representation of shape/trajectory information using piecewise-harmonic functions in curvature space, first described in [1]. The representation parameters are obtained through automated image processing techniques. Using this method we are able to analyze large amounts of nematode data relatively quickly, making it applicable to detailed worm-motion studies. References: 1. Padmanabhan V, Khan ZS, Solomon DE, Armstrong A, Rumbaugh KP, et al. (2012) Locomotion of *C. elegans*: A Piecewise-Harmonic Curvature Representation of Nematode Behavior. PLoS ONE 7(7): e40121. doi:10.1371/journal.pone.0040121

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