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Tracking C. elegans and its neuromuscular activity using NemaFlex II FRANK VAN BUSSEL, Texas Tech University, Dept. of Mechanical Engineering, MIZANUR RAHMAN, Texas Tech University, Dept. of Chemical Engineering, JERZY BLAWZDZIEWICZ, Texas Tech University, Dept. of Mechanical Engineering, SIVA VANAPALLI, Texas Tech University, Dept. of Chemical Engineering — NemaFlex is a recently developed experimental platform designed to analyze the movement and muscular strength of crawling C. elegans. Physically it is a microfluidic device consisting of an array of deformable PDMS pillars, with which the C. elegans interacts in the course of moving through the system; image data is then acquired through a transparent top plate. The software component uses this image data to track the worm's movements and measure pillar deflections and thereby the forces exerted by the worm, in a fully automated, high-throughput manner. In order to correlate the force results with muscle activations the pillar deflections need to be precisely associated with mechanical contact on the worm's body, which requires accurate determination and representation of the body's position within the complex background. Here we discuss issues encountered in extracting this position data from the surrounding environment.

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