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Machine Vision and Analysis for Optical Micromanipulation

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Poster Presentation P47

MACHINE VISION AND ANALYSIS FOR OPTICAL MICROMANIPULATION

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We are engaged in two distinct studies of optical micromanipulation, both of which require the development of machine vision algorithms. Our first study aims to characterize the extent of microparticle localization (*i.e.*, the trap volume) in a single-beam optical gradient trap ("optical tweezers") via analysis of the distribution of particle positions over time, using the statistics of (three-dimensional) Brownian motion as a metric of the trapping potential. We hope to compare "isoprobability surfaces" for different laser wavelengths. Our second study involves multiple particle species that are *not* trapped, but are entrained within a microfluidic flow passing through a three-dimensional optical lattice. We hope to build up detailed statistics of particle channeling within the lattice, and the details of dense-flow interactions.