

Abstract Submitted
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Using machine vision and data mining techniques to identify cell properties via microfluidic flow analysis¹ GEOFFREY HOROWITZ, SAMUEL BOWIE, ANNA LIU, NICHOLAS STONE, TODD SULCHEK, ALEXANDER ALEXEEV, Georgia Institute of Technology — In order to quickly identify the wide range of mechanistic properties that are seen in cell populations, a coupled machine vision and data mining analysis is developed to examine high speed videos of cells flowing through a microfluidic device. The microfluidic device contains a microchannel decorated with a periodical array of diagonal ridges. The ridges compress flowing cells that results in complex cell trajectory and induces cell cross-channel drift, both depend on the cell intrinsic mechanical properties that can be used to characterize specific cell lines. Thus, the cell trajectory analysis can yield a parameter set that can serve as a unique identifier of a cell's membership to a specific cell population. By using the correlations between the cell populations and measured cell trajectories in the ridged microchannel, mechanical properties of individual cells and their specific populations can be identified via only information captured using video analysis.

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