

# Dynamic spherical harmonics approach for shape classification of migrating cells.

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## Projects

Virtual infection model for *Aspergillus fumigatus* in human alveoli

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## Abstract

Cell migration involves dynamic changes in cell shape. Intricate patterns of cell shape can be analyzed and classified using advanced shape descriptors, including spherical harmonics (SPHARM). Though SPHARM have been used to analyze and classify migrating cells, such classification did not exploit SPHARM spectra in their dynamics. Here, we examine whether additional information from dynamic SPHARM improves classification of cell migration patterns. We combine the static and dynamic SPHARM approach with a support-vector-machine classifier and compare their classification accuracies. We demonstrate that the dynamic SPHARM analysis classifies cell migration patterns more accurately than the static one for both synthetic and experimental data. Furthermore, by comparing the computed accuracies with that of a naive classifier, we can identify the experimental conditions and model parameters that significantly affect cell shape. This capability should - in the future - help to pinpoint factors that play an essential role in cell migration.

## Identifier

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