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Actin Filament Tracking by the Localized Radon Transform in Three-Dimensional Electron Microscope Tomograms of Lamellipodia

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Abstract:

The objective is to introduce a method for the automatic tracking of actin filaments in electron tomograms of negatively stained lamellipodia. At the approach's heart is the use of a localized version of the Radon transform to derive filament directions. The selection of starting points and the choice of parameters are also addressed. Results are showcased for a cultured mouse embryo cell. The approach allows to visualize the filament network structure in 3d and to compute statistical information such as directional distributions.