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AUTOMATED DETECTION OF MITOTIC EVENT IN BIOLOGICAL CELLULAR DATA

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A detail quantitative study about the biological cellular characteristics such as mitosis, motility and morphology of the cell shape are important for the analysis of cell cycle behavior in the field of medicine. Time-lapse imaging system facilitates to develop computer vision based algorithms to automatically analysis the cell cycle. However the image quality and characteristic of cell cycle add new challenges for the existing segmentation and mitosis detection methodologies. This paper describes a careful study about the feasibility of mitosis detection using spatial features and proposes a novel approach for the cell segmentation and mitosis detection that employs spetio-temporal features in time-lapse image sequence. The proposed methodology employs cell behavior pattern to localize the mitotic cells and analyze the neighbor images for validation of mitosis. Further the described method in this paper, particularly segment the mitotic cell without perform tracking of individual cells throughout the image sequence for the mitotic detection. On the other hand the existing research works incorporates time consuming tracking task. Hence the computational time is very low when comparing with other methods. The proposed method described in this abstract is implemented using Matlab and evaluated with publicly available HeLa cells and that shows promising results for the localization of mitosis event and the validation or the detection part will be evaluated in the future work.

Keywords: Mitosis, Time-lapse, Fluorescent cell, Segmentation, Spatial feature.

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