UNIVERSITY OF SOUTH FLORIDA

Major Research Area Paper Presentation

A practical method of digital stain separation for deep learning-based automatic cell profile counts

by

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For the Ph.D. degree in Computer Science and Engineering

Quantifying cells in a defined region of biological tissue is critical for many clinical and preclinical studies. Deep learning-based approaches show comparable accuracy to manual counts of histologically stained cells at their maximal profile of focus in extended depth of field (EDF) images. However, a majority of the automated counts are designed for single-immunostained tissue sections. To expand the automatic counting methods to more complex dual-staining protocols, we developed a practical method to digitally separate stain color channels on images. The proposed method overcomes the limitations of the state-of-the-art stain-separation methods, like requirement of pure stain color basis as a prerequisite or stain color basis learning on each image. Our T J 0 Tc 0 Tw 19.617 0 Td (-)Tj -0.001 Tc 0.002 Tw [(s

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