

# UNIVERSITY OF SOUTH FLORIDA

## *Major Research Area Paper Presentation*

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

by  
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For the Ph.D. Degree in Computer Science 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 maximum 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 staining protocols, we developed a practical method to fully 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 in advance. Our results show that automatic counts by a deep learning method (originally designed for single immunostained images) on dual stain images after stain separation achieve comparable accuracy to manual counts. Thus, stain separated images can function as input to automatic deep learning based quantification methods designed for single stained tissue sections.

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1:00 PM

Online (Collaborate Ultra)

Please email [palakdave@usf.edu](mailto:palakdave@usf.edu) for more information

THE PUBLIC IS INVITED

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