

Abstract Submitted
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Automated Region of Interest Detection of Fluorescent Neurons for Optogenetic Stimulation JONATHAN MISHLER, DIETMAR PLENZ, Natl Inst of Mental Health - NIMH — With the emergence of optogenetics, light has been used to simultaneously stimulate and image neural clusters *in vivo* for the purpose of understanding neural dynamics. Spatial light modulators (SLMs) have become the choice method for the targeted stimulation of neural clusters, offering unprecedented spatio-temporal resolution. By first imaging, and subsequently selecting the desired neurons for stimulation, SLMs can reliably stimulate those regions of interest (ROIs). However, as the cluster size grows, manually selecting the neurons becomes cumbersome and inefficient. Automated ROI detectors for this purpose have been developed, but rely on neural fluorescent spiking for detection, requiring several thousand imaging frames. To overcome this limitation, we present an automated ROI detection algorithm utilizing neural geometry and stationary information from a few hundred imaging frames that can be adjusted for sensitivity.

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