Presentation

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Adaptive line-illumination scheme for high-speed two-photon fluorescence microscopy

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Abstract

We present a two-photon fluorescence microscope designed for high-speed imaging of neural activity in cellular resolution. Our microscope uses line illumination with an adaptive sampling scheme. Instead of building images pixel by pixel via scanning a diffraction-limited spot across the tissue, our scheme only illuminates the regions of interest (i.e., neuronal cell bodies), and samples a large area of them in a single measurement. This significantly increases the imaging speed and reduces the overall laser power on the sample. We characterized the imaging resolution and verified the concept of adaptive sampling through phantom samples. Our approach holds great promise for high-throughput neural activity imaging.

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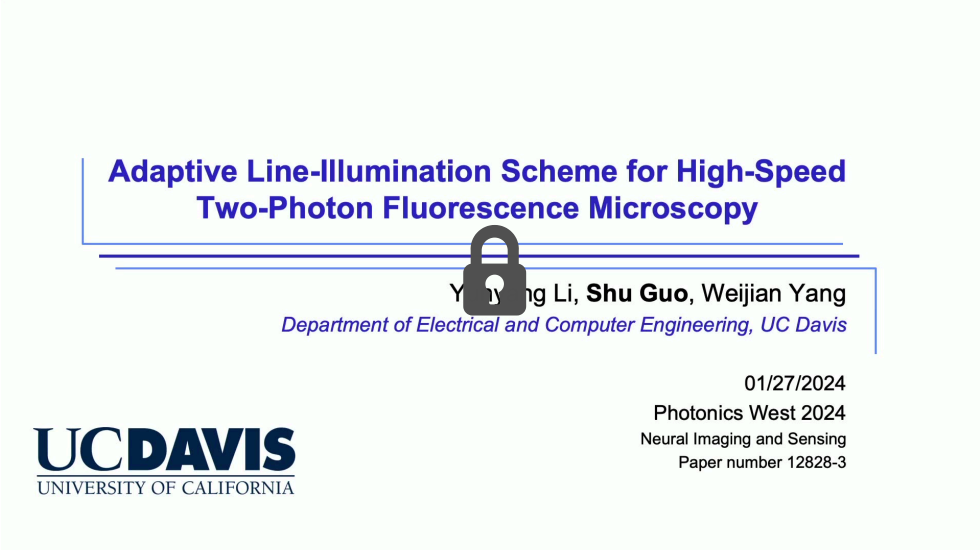

KEYWORDS

Biological samples

Two photon excitation microscopy