Internal Webinar

Computational microscopy for scan-free multidimensional imaging

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Fluorescence imaging is an indispensable tool in biomedical sciences to detect and track gene or protein expression profiles with high sensitivity and specificity. Current optical microscopes have to scan the sample, capturing one focal plane at a time. In this upcoming talk, I will present a novel method of scan-free snapshot 3D fluorescence microscopy. This method is based on the simultaneous optical encoding of all the depth planes into a single lateral plane, followed by a computational decoding step. I will also present lensless microscopy as a simple, portable, and cost-effective imaging method which enables digital refocussing, 3D imaging and phase imaging at ~1 µm lateral resolution with a partially coherent light source, a flat CMOS image sensor and an algorithmic image reconstruction.

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