THE UNIVERSITY OF ARIZONA
Wyant College of Optical Sciences

INDUSTRIAL AFFILIATES WORKSHOP

STUDENT SPEAKER PROFILE

DUSTIN TRAN, PH.D. STUDENT

Wyant College of Optical Sciences
Advisor: Leilei Peng

Tuesday, February 15, 2022 | 2:51 p.m.

Title: "Fluorescence Anisotropy Imaging Using a Low-cost, Polarization-sensitive CMOS Camera"

Abstract: Fluorescence anisotropy imaging is a commonly used technique to study biomolecular dynamics. It utilizes the polarization properties of fluorescence emissions that occur from changes in structure and orientation of fluorophores caused by angular displacement of the biomolecules. This can be an important tool to observe the dynamics of protein binding and organization for live cell studies. However, traditional fluorescence anisotropy imaging systems require the use of either multiple detectors or exposures to measure the extent of polarization in the emitted light. We present the capability of using a polarization-sensitive camera as a low-cost method of performing single-exposure fluorescence anisotropy imaging. Our setup utilizes a 5.0 MP polarization-sensitive monochrome CMOS sensor with an integrated wire grid polarizer array capable of performing simultaneous measurements of different polarization channels using a single detector. When combined with a scanning light sheet microscope, the method can achieve high speed, 3D observations of cellular dynamics at sub-micro resolution, which enables functional light sheet imaging of key biological activities, such as actin cytoskeleton dynamics during cell migration.

Bio: Dustin Tran is a Ph.D. Candidate in Dr. Leilei Peng's lab from the Department of Biomedical Engineering.

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