ACQUISITION AND ANALYSIS SOFTWARE FOR BASIC TO ADVANCED MICROSCOPY APPLICATIONS: A PRACTICAL WORKSHOP FOR OPEN SOURCE ACQUISITION SOFTWARE AND FOR GPU ACCELERATED DECONVOLUTION SOFTWARE FOR CLEAR FLUORESCENCE IMAGES IN REAL-TIME

Monday, February 8, 2016, 10AM - 3PM
Clark Center S360
RSVP required: stanfordbioxrsvp@stanford.edu

PARTICIPANTS:
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Software has become an integral part of any advanced (and some more basic) microscope imaging systems. In this workshop, we will discuss the role of software in image acquisition and walk participants through configuring an automated system using open source microscope acquisition software.

Additionally, we will introduce GPU Accelerated Real-Time Deconvolution Software. One of the biggest barriers to the more widespread use of deconvolution is the processing time involved with running many of these data sets which are generally processed overnight, after an experiment's completion. Recent advances in the acceleration of deconvolution image processing were published by Stanford's Manish Butte and Marc Bruce who have harnessed the processing power of GPUs (graphics processing units) in order to take the processing burden off of the CPU. The results from this processing are up 200X faster than previous commercial software packages. Additionally, the data obtained from this processing are more accurate as the software was designed with no shortcuts to speed up the iterations as other algorithms required. Thus, data are not compromised. This new method for deconvolution consequently provides greater accuracy and much faster results allowing researchers the opportunity to analyze their images during an experiment in real-time and make changes to samples based on data received versus waiting until the next day to conduct the experiment on another run after the deconvolution was run overnight. Strategies on how to decrease costs and stretch your research dollars by using this technique will also be discussed.

Please bring your laptop to follow along with the open source software and your image stacks that you would like to deconvolve.

Workshop Schedule:
10AM-3PM: Presentation of open source microscopy image acquisition software features and integration of microscopy and imaging components and introduction to deconvolution and improvements using GPU processing for faster, more accurate results. Includes a lunch break (lunch provided).

"One-on-One" Sessions with Facilitators:
12:30-5:00PM: Deconvolution
3:00-5:00PM: Open source imaging software
Please sign up for 15-30 minute time slots for your lab upon arriving.
Bring your image stacks to see them deconvolved.