Boyce Tsang

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Skills

- **Automations and programming**
  Analyze automation needs, and execute such automations on real-time operations and data analysis (MATLAB, LabVIEW (CLAD level), C++). Develop image analysis tools such as feature-finding, denoising and tracking tools. Develop graphical interfaces (GUI) combined with real-time calculations. Develop programs with high-speed hardware interfacing. Model with 3ds max for prototyping. Design novel schemes to perform function.
- **Optics and microscopy**
  Construct and maintain microscopes of various specialties including super-resolution, polarization and wide-field. Shape laser beams by phase masks and spatial light modulator.
- **Material science**
  Prepare various polymeric systems including biological materials and surfactants. Develop microfluidics for generating emulsions and mixing liquids. Analyze and perform various thin-film deposition methods including sputtering and electron beam evaporation.
- **Communication**
  Clear and effective communication and presentation to both technical and general audiences. Lead and divide work in teams.

Education

University of Illinois, Urbana-Champaign

PhD (Physics) *Dec 2015 (Expected) GPA: 3.93/4.00*

Chinese University of Hong Kong

BSc (Physics), 1st Honor *2011 GPA: 3.70/4.00*

Professional Experience

University of Illinois, Urbana-Champaign

Frederick Seitz Materials Research Laboratory

Research assistant *2011-2015*

- Steve Granick Group
  - Use of novel automation scheme to study molecular movement
    - Applied a unique way of fluorescent-tagging biopolymer protein that allows simultaneous monomer-precise tracking and contour tracking in real time.
    - Assembled an epi-fluorescence microscope, carried out experiments, and developed automated image and data analysis tools with MATLAB.
    - Developed a new analysis scheme to reveal microenvironment–dependent polymer diffusion.

- Manipulation of polymer materials using light
  - Constructed a photo-manipulation setup that includes beam steering by fast hologram calculation to mold polymeric assembly into arbitrary shapes with LabVIEW. Compared and evaluated hologram calculation approaches.
- Microrobots using liquid crystal droplets
  - Designed a chemical system that displays communication between small droplets.
  - Fabricated microfluidic devices to generate droplets at high uniformity.
  - Constructed a polarized microscope that visualizes the signal flow between droplets.
  - Developed automated data analysis on signal propagation paths with MATLAB

❖ Written reports and technical papers for all the works above.

❖ Commended with University Fellowship and Scott Anderson Graduate Student Award.

Teaching assistant *2011*

- Led small group discussions followed by mini-lectures.

❖ Commended with Excellent teacher award.

University of California, Berkeley

Research assistant *2010*

- Feng Wang Group
  - Converted an economical diode laser into lithographic tool with external cavity.
  - Fabricated and characterized sub-micron periodic grooves on photoresists.

Chinese University of Hong Kong

Research assistant *2008-2011*

- Hong-Kuen Wong Group
- Study of crystallinity in ReBCO and LCMO thin films
  - Grew epitaxial thin film on Si(110) with Ar sputtering.
  - Prepared sputtering target from raw material with ball-milling and sintering.
  - Performed maintenance and operation of an X-ray diffraction equipment.

Publications

- Boyce Tsang and Steve Granick. Unexpected dynamical locality in entangled actin solution. *PRL (In preparation)*
- Lingxiang Jiang, Boyce Tsang, Steve Granick. Visualize space-dependence of viscosity. *PRL (In preparation)*
- Boyce Tsang, Yongfeng Zhou and Steve Granick. Sculpting polymer with lasers. *(In preparation)*
- Ah-Young Jee, Boyce Tsang, Steve Granick. Colloidal phase transitions: A switch for phase shifting. *Nature Materials*, **14**, 17–18 (2015)
- Boyce Tsang, Changqian Yu, and Steve Granick. Polymers Zippered-Up by Electric Charge Reveal Themselves. *ACS Nano,* **8**, 11030-11034 (2014)