Yiyang Chen

chen.yiyang@wustl.edu | +1 (314) 934-0562 | yiyangc1999.github.io

Education

Washington University in St. Louis (WashU) — St. Louis, MO, USA
PhD in *Imaging Science* — Sept 2021 - present

- **Advisor**: Dr. Matthew Lew
- **Thesis** (unfinished): Multi-dimensional Single Molecule Nanoscopy to Elucidate the Structure and Conformational Dynamics of Cell Membrane Proteins
- **Coursework**: Machine Learning, Large-scale Optimization for Data Science, Detection and Estimation Theory, Theoretical Imaging Science, Fundamentals and Applications of Modern Optical Imaging ...

Nankai University — Tianjin, China
BS in *Physics*, Poling Class of Physics — Sept 2017 - June 2021

- **Thesis**: The Study of Deformability of Human Erythrocyte Based on Microfluidics
- **Coursework**: Electrodynamics, Optics, Introduction to Biophysics, Molecular Biophysics, Biomedical Physics ...

Research Experience

Single-Molecule Orientation Localization Microscopy (SMOLM) — May 2022 – present
Lew Lab, Department of Electrical & Systems Engineering, Washington University in St. Louis — St. Louis, MO, USA
Advisor: Dr. Matthew Lew

- Analyze fundamental precision limits for resolving the orientation separation of two spatially overlapping fluorescent dipole emitters.
- Design and engineer dipole-spread function (DSF) using optimization algorithms.
- Develop appropriate labeling techniques for protein imaging in orientation microscopy.

Study of Human Red Blood Cells Based on Microfluidics and Single-Molecule Localization Microscopy — Apr 2019 – June 2021
Biomedical Optics Lab, School of Physics, Nankai Univerisity — Tianjin, China
Advisor: Dr. Leiting Pan

*This project is supported by the *China National University Student Innovation & Entrepreneurship Development Program*.

- Measured human red blood cell deformability by the speed of cells traveling through narrow channels.
- Designed microfluidic ratchet chip for sorting the hRBCs in different life stages, and confirmed availability with COMSOL simulation.
- Imaged the structure of actin-spectrin network on hRBC membrane cytoskeleton and hRBC membrane protein CD47 diffusivity using STORM, with related data analysis using MATLAB.

Immunofluorescent Biomarker for Zebrafish Somitogenesis and Single Cell Oscillation — July 2019 – Sept 2019
Yang Lab, Department of Biophysics, University of Michigan — Ann Arbor, MI, USA
Advisor: Dr. Qiong Yang

- Developed immunofluorescent biomarkers for different signaling pathways, *Ntla* and *Tbx16*, in zebrafish somitogenesis process and segmentation clock.
- Distinguished oscillating cells of different phenotypes within both zebrafish embryos and cell dispersal systems.

Publications

Preprints

1. **Chen, Y.**, Qiu, Y. & Lew, M. D. Resolving the Orientations of and Angular Separation between an Overlapping Pair of Dipole Emitters. *arXiv* 2406.04469 (2024), under review at *Phys. Rev. Lett.*.

Conference Presentations

1. "**Resolving the Orientations of and Separation between an Overlapping Pair of Dipole Emitters**". *Gordon Research Conferences: Single Molecule Approaches to Biology*, Newry, ME, July 2024 (poster)

Professional Activities

Spectra, WashU Optica (formerly OSA) & SPIE joint student chapter

- Co-president (Optica liaison) 2023 - 2024
- Vice president (Imaging Science Pathway liaison) 2022 - 2023

Medical Physics Summer School at Duke Kunshan University Aug 2020

The Physics of Life Online Summer School at Princeton University June 2020 - Aug 2020

Nankai Physics Optica (formerly OSA) **student chapter**

- Student officer 2018 - 2020

Honors and Awards

Excellence Award, China National University Student Innovation & Entrepreneurship Development Program Mar 2021

First Prize, Nankai Physics Tournament May 2018

Poling Scholarship, Nankai University Oct 2017

Skills

Software: MATLAB, Python, Wolfram Mathematica, PyMOL

Laboratory: Cell culture, Immunolabeling

Languages: Chinese (native), English (proficient)