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 candidate in *Imaging Science* — Sept 2021 - present

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

Nankai University, NKU — Tianjin, China
BSc (honor) in *Physics*, Poling Class of Physics — Sept 2017 - June 2021

- **Thesis**: The Study of Deformability of Human Erythrocyte Based on Microfluidics
- **Research Advisor**: Dr. Leiting Pan
- **Coursework**: Electrodynamics, Optics, Introduction to Biophysics, Molecular Biophysics, Biomedical Physics, Mathematical Methods in Physics, ...

Research Experiences

Single-Molecule Orientation Localization Microscopy (SMOLM) — May 2022 – present
Lew Lab, The Preston M. Green Department of Electrical & Systems Engineering, WashU — St. Louis, MO, USA
Graduate Research Assistant, Advisor: Dr. Matthew Lew

- Analyzed 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.
- Characterize labeling techniques for protein imaging in orientation microscopy.

Study of Human Red Blood Cell Membrane Characteristics Based on Microfluidics and Single-Molecule Localization Microscopy — Apr 2019 – June 2021
Pan Biomedical Optics Group, School of Physics, NKU — Tianjin, China
Undergraduate Research Assistant & *Team Leader*, 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 and simulated a microfluidic ratchet chip to sort hRBCs by life stage, verified using COMSOL.
- Analyzed hRBC actin-spectrin network and CD47 diffusivity on hRBC membranes using single-molecule localization microscopy (SMLM).

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

- Developed immunofluorescent biomarkers targeting signaling pathways (*Ntla* and *Tbx16*) for studying zebrafish somitogenesis and segmentation clock dynamics.
- Identified and characterized oscillating cells with different phenotypes in zebrafish embryos and cell dispersal systems.

Publications

1. **Y. Chen**, Y. Qiu, & M. D. Lew, Resolving the Orientations of and Angular Separation Between a Pair of Dipole Emitters, *Phys. Rev. Lett.* **134**, 093805 (2025)

Conference Presentations

3. "**Combining Excitation and Emission Modulation Resolves the Angular Separation Between a Pair of Dipole Emitters**", oral. *Optica Biophotonics Congress: Optics in the Life Sciences*, Coronado, CA, April 2025
2. "**Resolving the Orientations of and Separation between an Overlapping Pair of Dipole Emitters**", poster. *Gordon Research Conferences: Single Molecule Approaches to Biology*, Newry, ME, July 2024
1. "**Immunofluorescent Biomarkers for Distinguishing Cell Phenotypes in Zebrafish Somitogenesis and Autonomous Cellular Oscillators**", poster. *APS March Meeting 2020*, Denver, CO, March 2020 (online)

Professional Activities

Spectra, Optica (formerly OSA) & SPIE joint student chapter at *Washington University in St. Louis*

Co-president (Optica liaison) 2023 - 2024

- Organized 2024 Spectra student-led conference and served as committee co-chair.
- Organized Spectra summer coffee hour & career panel series.

Vice president (Imaging Science Pathway liaison) 2022 - 2023

- Participated in Spectra SciFest outreach activity at St. Louis Science Center.
- Organized monthly student seminars (joint with WashU Imaging Science Student Chapter).

Medical Physics Summer School at *Duke Kunshan University* Aug 2020

The Physics of Life Summer School (virtural) at the *Center for the Physics of Biological Function, Princeton University* June 2020 - Aug 2020

Optica (formerly OSA) **student chapter** at *School of Physics, Nankai University*

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

Teaching Experiences

Fundamentals and Applications of Modern Optica Imaging Spring 2024

Washington University in St. Louis

Assistant Instructor, Course Instructor: Dr. Matthew Lew

College Physics Fall 2019

Nankai University

Undergraduate Teaching Assistant, Course Instructor: Dr. Jianghong Yao

Skills

Programming & Software: MATLAB, Python, Wolfram Mathematica, ImageJ, COMSOL Multiphysics, PyMOL

Laboratory: Cell culture, Immunolabeling

Languages: Chinese (native), English (fluent), French (basic)

Licenses & Certifications:

- *Deep Learning Specialization*, DeepLearning.AI
  A series of 5 courses: 1) Neural Networks and Deep Learning; 2) Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization; 3) Structuring Machine Learning Projects; 4) Convolutional Neural Networks; 5) Sequence Models.
- *Introduction to Programming with MATLAB*, Vanderbilt University