Jiazhou Cheng

757 Syracuse Ave, Unit 1N, St. Louis, MO 63130 • +1 314-629-1344 • c.jasmine@wustl.edu

EDUCATION

Washington University in St. Louis — St. Louis, MO

B.S. in Electrical Engineering — Aug 2020 – May 2024 (Expected)

Second Major in Mathematical sciences, Minor in Computer Science

GPA: 4.0/4.0

Selected coursework:

Fundamentals and Applications of Modern Optical Imaging
Biological Imaging Technology (SP 2024)
Introduction to Machine Learning (CS)
Introduction to Analysis (Math)

HONORS, AWARDS, FELLOWSHIPS

Dean's Select Fellowship	McKelvey School of Engineering	2023
Summer Undergraduate Research Award	Washington University in St. Louis	2023, 2022
Russell R. Pfeiffer Outstanding Junior Award	Dept. of Electrical and Computer Engineering	2023
Brian Blank Award	Dept. of Mathematics	2023
Antoinette Frances Dames Award	McKelvey School of Engineering	2022
Dean's List	McKelvey School of Engineering	All Semester

PUBLICATIONS

1. (In Prep) **J. Cheng**, B. Sun, T. Wu, O. Zhang, M. D. Lew, "Robust 6D Video-rate Fluorescent Microscopy."

PRESENTATIONS

Oral Presentations

1. "Honor Thesis: Robust 6D Video-rate Fluorescence Microscopy," *ESE Day*, St. Louis, MO, Dec 2023.
2. "An Active Stabilizing Feedback Module for Long-Term Super-Resolution Microscopy," *Undergraduate Research Symposium*, St. Louis, MO, Oct 2022.

Poster Presentations

1. "Robust 6D Video-rate Fluorescence Microscopy," *2023 SPECTRA Conference*, St. Louis, MO, Nov 2023.
2. "Robust 6D Video-rate Fluorescence Microscopy," *Undergraduate Research Symposium*, St. Louis, MO, Oct 2023.
3. "Methodology – Robust 6D Video-rate Fluorescence Microscopy," *ESE Day*, St. Louis, MO, May 2023.

RESEARCH EXPERIENCE

Lew Lab (PI: Dr. Matthew D. Lew) — St. Louis, MO

Undergraduate Researcher — Feb 2022 – Present

Honor Thesis: *Robust 6D Video-rate Fluorescence Microscopy* (Poster) — SP 2023 – Present

- Built computational model to simulate vectorial diffraction theories.
- Developed deconvolution algorithm that solves high-dimensional inverse problem in video-rate.
- Designed simulated performance tests to evaluate the system quantitatively.
- Demonstrated the compatibility of the system with optical microscope via lipid membrane and cell imaging.

Independent Project: *An Active Stabilizing Feedback Module for Long-Term Super-Resolution Microscopy* — SP 2022 – FA 2022

- Formulated a mathematical model for light scattering based on beam optics theories.
- Calibrated the optical setup.
- Set optimization problem to fit the model to silicon bead image.

Z-Lab for Biophotonics (PI: Dr. Chao Zhou) — St. Louis, MO

Undergraduate Researcher — Aug 2023 – Present

- Schemed the optical path prototypes and simulated the light rays using optical design software.
- Assembled and designed the optomechanical elements.

CLASS PROJECTS

Optical Pupil Design

ESE 582 Fundamentals and Applications of Modern Optical Imaging

- Customized and simulated high-resolution and low-resolution programmable pupil.
- Customized high-contrast pupil with nonuniform phase for imaging simulated transparent virus particles.

Optical System Design

ESE 582 Fundamentals and Applications of Modern Optical Imaging

- Schemed and simulated a compact optical system consisting of commercial lens.
- Used the schematic to focus virtual objects at different positions and estimated the location of the object.

Pulse Amplitude Modulation Communication

ESE 351 Signals and Systems

- Up-converted PAM binary signals with a carrier frequency and down-converted them over adjacent frequency bands.
- Designed pulse shape that minimize the required spectral bandwidth.
- Evaluated the performance of difference pulse shapes due to additive noise.

Multi-band Equalizer

ESE 351 Signals and Systems

- Modeled an equalizer with picked frequency bands that aims to process audio in different circumstances.
- Fixed gain settings for different audio presets, including bass, treble boost, and unity.
- Revised the gain setting to filter out unintentional noises in several audio clips.

TEACHIING EXPERIENCE

ESE 351 Signals and Systems St. Louis, MO

Assistant Instructor, Dept. of Electrical and System Engineering FA 2022 – SP 2023

- Created homework problems based on signals and systems theories.
- Wrote formal homework solution for 9 homework problem sets.

CSE 260M Introduction to Digital Logic and Computer Design St. Louis, MO

Assistant Instructor, Dept. of Computer Science and Engineering SP 2022

- Held weekly office hour about theoretical homework problems and VHDL circuit design.

ESE 105 Introduction to Electrical and Systems Engineering St. Louis, MO

Grader, Dept. of Electrical and System Engineering FA 2021

- Graded 5 biweekly MATLAB homework for 60 students.

ACTIVITIES

Ursaworks Robomaster Club St. Louis, MO

Mechanical, electrical, software engineer FA 2023 – Present

- Designed mechanical framework and assembled the car robot.
- Developed computer vision algorithm that auto aim the opponents.

SKILLS

Programming Languages	Python, MATLAB, Java, Mathematica, R, C, Assembly Language
Optical Design Software	Zemax OpticStudio
Imaging Analysis Software	ImageJ
Hardware Description Languages	VHDL
Electronic Circuit Simulator	Cadence, PSpice, LTSpice
CAD Software	Solidworks