

Yifei Jin

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OBJECTIVES AND HIGHLIGHTS

- Ph.D. candidate in Electrical & Computer Engineering, seeking an optical and electrical engineering internship for the Summer of 2025
- Extensive research in multispectral imaging systems for image-guided surgery and intraoperative pathology
- One first-author research paper was published in the *Journal of Biomedical Optics*. Another first-author research paper under review by the *Science Translational Medicine*
- Nearly two years of industrial experience in circuit design and verifications

EDUCATIONS

Ph.D. in Electrical & Computer Engineering 08/2021 – Expected 05/2026
University of Illinois at Urbana-Champaign (UIUC), Urbana, IL

BS in Electrical & Computer Engineering 08/2016 – 05/2019
Worcester Polytechnic Institute (WPI), Worcester, MA

RESEARCH PROJECTS

In-vivo UV-Visible-NIR Lensless Microscopy, UIUC 01/2024 – Present

- Designed a high-resolution multispectral lensless microscopy system for imaging labeled and label-free fluorescence of metastatic lymph nodes in vivo
- Integrated several fluorescence excitation light sources into the microscopy system
- Developed camera software with advanced image reconstruction algorithms to optimize resolution and field of view
- Conducting clinical studies to validate microscopy performance in fluorescence margin imaging

Biomimetic Image Sensor for Intraoperative Metastatic Lymph Node Detection, UIUC 01/2022 – 05/2024

- Contributed to the design of a UV-Visible-NIR camera system, enhancing image-guided cancer surgery and intraoperative pathology capabilities
- Performed comprehensive optoelectronic characterizations (e.g., quantum efficiency and uniformity calibration) and implemented clinical studies to assess diagnostic accuracy of metastatic lymph node detection statistically
- Differentiated colors of multiple NIR fluorescence through a Hue-Saturation map with controlled intensity
- Submitted a research paper to *Science Translational Medicine* (under review)

Convolutional Neural Network-based Demosaicing for Color-NIR Sensors, UIUC 06/2023 – 04/2024

- Designed a convolutional neural network model with residual learning for demosaicing a hexachromatic color-NIR camera, significantly improving image quality over traditional methods
- Trained and evaluated the model's performance using both preclinical and clinical imaging data, achieving superior results in key image quality metrics for both color and NIR channels
- Published a research paper in the *Journal of Biomedical Optics* (DOI: <https://doi.org/10.1117/1.JBO.29.7.076005>)

Tracking Accuracy Improvement for Tongue Drive System with Magnetic Sensor Array, WPI 11/2019 – 12/2020

- Created a virtual environment through MATLAB to simulate the optimum distribution of 32 magnetic sensor arrays with minimum localization error
- Designed the sensors array PCB and the SPI communication protocol to send serial data to PC in real time
- Optimized the data to 5D localization through multiple optimization algorithms in Python

WORKING EXPERIENCE

Graduate Teaching Assistant, UIUC 08/2023 – 12/2023

- Instructed students in digital circuit design on FPGA, covering fundamental design concepts
- Taught SPI and I²C communication protocols, empowering students to integrate multiple sensors effectively
- Led a final project where students designed a camera system based on FPGA, featuring real-time object tracking

Hardware Engineer at Teradyne, North Reading, MA 06/2019 – 04/2021

- Developed power semiconductor DC testing instrument HVVI (high-voltage VI channel) module
- Designed verification software through VB to implement bring-up and verification tests of circuit designs
- Solved circuit designing problems in harmonic, glitch, noise, and bandwidth limitations

SKILLS

- Programming: Python, Pytorch, OpenCV, Verilog/VHDL, VB, and C/C++
- Software: Vivado, MATLAB/Simulink, Linux, Code Composer Studio, Quartus II, CADENCE, and KiCAD
- Optical Equipment: Monochromator, Integrating Sphere, Optical Power Meter, Spectroscopy, and Optomechanics
- Laboratories: High-speed Interfaces (SPI, I²C), Function Generator, Oscilloscope, PCB, and Soldering Station