

Yifei Jin

Cell: 508-369-5422 | Email: yifeij7@illinois.edu | Website: www.yifeij7.com

Address: 1115 Baytowne Drive, 23, Champaign, IL, 61822

OBJECTIVES AND HIGHLIGHTS

- Ph.D. candidate in ECE, seeking a hardware engineering internship related camera / display starting from May 2025
- Proficient with camera system, hardware engineering, optics, machine-learning / computer vision
- Extensive research in multispectral camera systems for image-guided surgery and intraoperative pathology
- Nearly two years of industrial experience in circuit design and verification as a hardware engineer

EDUCATIONS

- Ph.D. in Electrical & Computer Engineering (GPA: 3.67/4.0) 08/2021 – Expected 12/2025
University of Illinois at Urbana-Champaign (UIUC), Urbana, IL
- BS in Electrical & Computer Engineering (GPA: 3.94/4.0) 08/2016 – 05/2019
Worcester Polytechnic Institute (WPI), Worcester, MA

WORKING EXPERIENCE

- Graduate Teaching Assistant, UIUC 08/2023 – 12/2023
- Instructed students in digital circuit design and verification 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 and simulated a camera system based on FPGA through Verilog featuring real-time object tracking
- Hardware Engineer at Teradyne, North Reading, MA 06/2019 – 04/2021
- Participated in the development of power semiconductor DC testing instrument high-voltage VI channel module (HVVI) for UltraFLEX^{plus} Automatic Test Equipment
 - Designed verification software through VB to implement bring-up and verification tests of circuit designs
 - Solved circuit design problems in harmonic, glitch, noise, and bandwidth limitations

RESEARCH PROJECTS

- In-vivo UV-Visible-NIR Lensless 3D Microscopy, UIUC 01/2024 – Present
- Designed a multispectral lensless microscopy for imaging metastatic lymph nodes in vivo, archiving single-shot 3D imaging of UV and NIR fluorescence simultaneously
 - Integrated several fluorescence excitation light sources into the microscopy system through PCB
 - Developed camera software with advanced computational imaging algorithms to optimize resolution and field of view
 - Conducting clinical studies to validate microscopy performance in fluorescence margin imaging of tumor
- 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 image signal processing (e.g., Auto Exposure & White Balancing and Color Correction Matrix) from end to end
 - Differentiated multiple NIR fluorescence with different emission spectrums through a fake color map
 - Implemented clinical studies to assess diagnostic accuracy of metastatic lymph node detection statistically
- 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 a 32 magnetic sensor array with minimum localization error to enhance Tongue Drive System tracking accuracy
 - Designed the sensor array PCB and the SPI protocol to send serial data to PC in real time through FPGA
 - Optimized the sensor data to 5D localization through multiple optimization algorithms in Python

SKILLS

- Programming: Verilog/VHDL, SystemVerilog, Python, Pytorch, OpenCV, 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