Yifei Jin

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OBJECTIVES AND HIGHLIGHTS

- Ph.D. candidate in Electrical & Computer Engineering, seeking a full-time Engineer position starts from 01/2026
- Proficient with camera system, hardware engineering, optics, machine-learning/computer vision
- Extensive research in multispectral camara 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   08/2021 – Expected 12/2025
University of Illinois at Urbana-Champaign (UIUC), Urbana, IL
BS in Electrical & Computer Engineering   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