Yongli He

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EDUCATION

University of Michigan — Ann Arbor, MI
Ph.D. in progress, Applied Physics — Expected: Apr. 2027
M.Sc. Electrical and Computer Engineering (GPA: 4.00/4.00) — May 2025

Huazhong University of Science and Technology (HUST) — Wuhan, China
B.Sc., Physics (*with honors*, GPA: 3.97/4.00) — Sept. 2018 - June 2022

RESEARCH EXPERIENCE

Functional MRI Lab, Univ. of Michigan — Ann Arbor, MI
Graduate Student Research Assistant — Dec. 2022 - Present
Supervisors: Jon-Fredrik Nielsen, Ph.D., Doug Noll, Ph.D.

- **Multidimensional MRI RF Pulse Design**
  Developed autodifferentiation-based RF pulse design tool for spatially-selective excitation in steady-state sequence.
- **Advanced fMRI image acquisition/reconstruction**
  Developing new image acquisition scheme / reconstruction framework for more reliable multi-echo fMRI.

Wuhan National Lab for Optoelectronics, HUST — Wuhan, China
Undergraduate Research Assistant — Mar. 2020 - Apr. 2022
Supervisor: Jiang Tang, Ph.D., Boxiang Song, Ph.D.

- **Quantum Dot Infrared Photodetector Design Based on FDTD Simulation**
  Designed metasurfaces to enhance external quantum efficiency of the infrared photodetectors.
  Optimized structures of quantum dot (QD) infrared photodetectors to maximize light absorption.
- **Perovskite-based X-ray Photodetector Design Based on Monte Carlo Simulation**
  Modeled and Simulated X-ray incidence on $MAPbI_3$ photodetector using Geant4.
  Analyzed the energy deposition spectrum of the process and provided guidance to the fabrication.

NCSU GEARS, Summer Research Program — Raleigh, NC
Research Assistant (Remote) — Jul. 2021 - Aug. 2021

- **Simulation Study of Two-Dimensional Charge Carriers at AlN/GaN Heterointerface**
  Conducted simulation to explore the conditions that give rise to 2D hole gas (2DHG) at the heterointerfaces.
  Presented in a poster that the 2DHG charge densities can be controlled by varying the quantum well width at the heterointerface.

Undergraduate Thesis Research — Wuhan, China
Research Assistant — Aug. 2021 - May 2022

- **Applications of Parallel Computing in Ultrafast Optics**
  Computed the high-order harmonics generation (HHG) and above-threshold ionization (ATI) spectra of laser-molecular interaction in one-dimensional simulation using Fortran (serial computation)
  Computed the HHG and ATI spectra in three-dimensional cases using parallel computing (OpenMP and MPI)

RESEARCH INTERESTS

MRI pulse design; MRI reconstruction; Computational imaging; Inverse problems; Machine/Deep learning;

JOURNAL PUBLICATIONS

[J2] **Y. He**, B. Song, J. Tang. "Optical metalenses: fundamentals, dispersion manipulation, and applications.", *Front. Optoelectron.*,15, 24 (2022). DOI.

[J1] **Y. He**, D.C. Noll, J.-F. Nielsen, "Improved Accuracy of Multidimensional Spatially-Selective Saturation RF Pulses for Steady-State Imaging," (in preparation)

CONFERENCE PROCEEDINGS AND ABSTRACTS

[C3] **Y. He**, L. Hernandez-Garcia, D.C. Noll, J.-F. Nielsen. "Investigating the Impact of Spatially Selective Signal Suppression on BOLD fMRI Reliability" *International Society for Magnetic Resonance in Medicine Annual Meeting*, 2025. (digital poster).

[C2] **Y. He**, R. Fung, J.-F. Nielsen. "High-Accuracy Ultra-short Inner-Volume Saturation Pulse for 3D Steady-State Imaging." *International Society for Magnetic Resonance in Medicine Annual Meeting*, 2024. (digital poster).

[C1] **Y. He**, P. Liu, L. Gao, B. Song, J. Tang. "Efficient Colloidal Quantum Dot Short-infrared Photodetectors with Coupled Metasurfaces." *International Photonics and OptoElectronics Meetings*, 2022. (Poster).

TECHNICAL EXPERIENCE AND SKILLS

- **MRI Image Reconstruction**
  Model-based image reconstruction; non-Cartesian sampling (NUFFT); regularized reconstruction (TV, l_1-wavelet, Tikhonov, etc); spatiotemporal modeling for dynamic imaging.
- **MRI Pulse Sequence**
  Development platform: Pulseq (MATLAB)
  Sequence types: GRE, SE/FSE
  Sampling Scheme: 3D/SMS-EPI, Stack-of-spiral
- **Software Development**
  Programming language: MATLAB, Python, Julia, LaTeX, Fortran, C++
  IDE/Package management: VS Code, Conda, PiP
  Parallel programming: OpenMP, MPI
  Version control: Git/Github

PROFESSIONAL SERVICES

Reviewer

Conferences

- International Society for Magnetic Resonance in Medicine Annual Meeting (ISMRM & ISMRT annual meeting)

HONORS AND AWARDS

National Scholarship 2020

Department of Education, China
0.2% of the class nationwide

Outstanding Undergraduate Award 2020

Huazhong Univ. of Sci. and Tech.
1.5% of the class in the university

First Prize of The National College Student Mathematics Competitions 2019
Chinese Mathematical Society