Yidi Huang

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Google Scholar

Education

George Mason University — Fairfax, VA
Ph.D. in Electrical and Computer Engineering, Advised by Dr. Ningshi Yao, GPA: 3.90/4.00 — *2022.01 – Present*

- **Research Focus**: Robotic Eye Platforms, Nonlinear Dynamics and Control, Human–robot Interaction, and Vision-based Biomedical Applications.

University of Florida — Gainesville, FL
M.S. in Electrical Engineering, GPA: 3.83/4.00 — *2020.01 – 2021.12*

- **Relevant Courses**: Fundamental Machine Learning, Deep Neural Networks, Image Processing and Computer Vision, Linear Multivariable Control, Analysis of Algorithms, Pattern Recognition

Henan University of Science and Technology — Luoyang, China
B.E. in Mechatronics Engineering, GPA: 3.2/4.00 — *2014.09 – 2018.07*

- **Relevant Courses**: Mechanical Design, Basis of Control Engineering, Electrical Control and PLC, Industrial Robotics, Basis of Digital Design, Electronic Technology

Co-op & Research Experience

CIAO Lab, George Mason University (ciaolab.org) — Fairfax, VA
Graduate Researcher — *2022 – Present*

- Led the development of a robotic eye platform as a core Ph.D. research project, aiming to study how the human eye is structured, how precise eye rotations are controlled, and how binocular vision is formed.
- Conducted interdisciplinary work combining robotics, biomechanics, and vision science, collaborating with advisors and lab members to design experiments and validate the platform.
- Additionally, designed and tested a robotic blimp platform, applying neural networks and image recognition for real-time target detection and autonomous flight control as part of the GMU Blimp Squad.

UF SmartData Lab (smartdata.ece.ufl.edu/) — Gainesville, FL
Lab Assistant — *Feb 2021 – Jul 2021*

- Applied PCA, Random Projection, and Autoencoder for ultrasonic data compression/reconstruction in structural health monitoring.
- Analyzed effects of humidity, light, and temperature on ultrasonic signals using ML methods.
- Built online learning methods for defect detection under limited data conditions.

General Electric Company (ge.com) — Remote (China)
Software Design Engineer Intern — *Jul 2018 – Oct 2018*

- Developed a Python-based human–computer interaction interface to support inverter and current protector selection in biomedical filtration systems.
- Implemented data analysis and database management functions within the interface, improving usability and system compatibility.
- Assisted project supervisors with file management, data processing, and integration testing to ensure smooth deployment.
- Analyzed heterogeneous data sources and built system models to support decision-making and performance optimization.

Industry Experience

Epitome Research and Innovations Inc. (https://www.epitomeri.com/) — Fairfax, VA
Engineering Intern (Supervisor: Satish Chimakurthi, Ph.D.) — *Jun 2024 – Nov 2024*

- Supported a U.S. Army–sponsored project by contributing to the development of a robotic eye platform for testing and validating advanced eye-tracking technologies.
- Translated project requirements into technical specifications and assisted in hardware–software integration, ensuring system functionality and compatibility.
- Conducted software debugging, performance testing, and iterative validation to meet project milestones under strict timelines.
- Collaborated with a multidisciplinary engineering team to deliver functional prototypes aligned with defense project standards.

Selected Research Projects

Cable-Driven Robotic Eyes (youtube.com/watch?v=kyB37qDjsQo, youtube.com/watch?v=AFu2d3NaREc) Fairfax, VA
Graduate Research Project *Mar 2022 – May 2024*

- Built a robotic eye that closely mimics the size, movement, and muscle structure of the human eye using cable-driven actuation.
- Developed control methods that allow the eye to move quickly and accurately, following natural rules of human eye movement.
- Created a system to show what patients with crossed eyes (strabismus) actually see, and designed a new way to measure how severe the condition is.
- Used the platform to explore how the human eye is structured, how the brain controls precise eye rotations, and how the two eyes work together to form a single visual perception.

Unveiling the Dynamics of Human Decision-Making Fairfax, VA
Graduate Research Project *Oct 2023 – Jan 2024*

- Studied how humans and robots make decisions together in shared tasks.
- Ran experiments with a robotic arm to understand strategies people use and how collaboration can be improved.

Anti-slip Iron Shoes System (Railway) Luoyang, China
Undergraduate Capstone Project *Jan 2017 – Jun 2017*

- Designed anti-slip iron shoes with laser/vibration sensors to detect train slip conditions.
- Integrated wireless communication and wireless charging modules for monitoring and power supply.

Publications

1. **Y. Huang**, Q. Wei, J. L. Demer, et al. "See What a Strabismus Patient Sees Using Eye Robots," *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 4627–4632, 2023.
2. A. Qureshi, A. Ryan, **Y. Huang**, et al. "A Linear Slide Platform for 3D Ocular Ultrasound Imaging," *Investigative Ophthalmology & Visual Science*, vol. 65, no. 7, p. 5558, 2024.
3. R. Kumar, **Y. Huang**, N. Yao. "Unveiling the Dynamics of Human Decision-Making: From Strategies to False Beliefs in Collaborative Human-Robot Co-Learning Tasks," *Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pp. 632–636, 2024.
4. **Y. Huang**, N. Yao, Q. Wei. "A Novel Cable-driven Eye Robot for Human Vision Visualization and Strabismus Diagnosis," *Scientific Reports*, under review.

Technical Skills

- **Programming & Tools**: Python, C++, MATLAB, Git, Docker, Linux
- **Libraries & Frameworks**: NumPy, Pandas, OpenCV, PyTorch, Scikit-learn, Tkinter, PyQt / PySide
- **Data & Databases**: SQL/NoSQL (MongoDB), data analysis, big data processing
- **Robotics/Controls**: control systems, computer vision, real-time systems; bench testing (board-level)
- Experienced in analyzing heterogeneous data sources and building system models to support decision-making and performance optimization
- Strong communication, teamwork, and project documentation; cross-functional collaboration in research and industry teams