

Xiaorui Gu

xiaoruigu2027@u.northwestern.edu | 217-418-8846 | www.guxiaorui.com | www.linkedin.com/in/xiaoruigu

Education

Northwestern University

M.S. in Electrical Engineering

Evanston, IL
Sep 2025 - Jun 2027 (Expected)

University of Illinois

B.S. in Mechanical Engineering

Minor in Electrical Engineering

Control Systems Track

Urbana, IL
Aug 2021 – May 2025

Research

Center for Robotics and Biosystems

Aug 2025 – Present

Advisor: Prof. J. Edward Colgate, Northwestern University

- Developing tactile sensing skin for enhancing robotic dexterity under contact-rich tasks.

Mobility and Fall Prevention Research Laboratory

Jun 2024 – Mar 2025

– Advisor: Prof. Manuel E. Hernandez, University of Illinois

- Developed a piezoresistive pressure sensor array based on Velostat, achieving high sensitivity and portability for gait analysis and rehabilitation exercise.
- Designed an interactive LED-based visual guide synchronized with a mobile device UI.
- Programmed and tested firmware in C++ on ESP32 S2 for data acquisition, ensuring reliable sensor integration.

Bahl Research Group

Aug 2023 – Jan 2025

– Advisor: Prof. Gaurav Bahl, University of Illinois

- Designed and constructed experimental setups for a fully levitated 6-DOF system, potentially for use in low-frequency signal generation and IMUs.
- Provided manufacturing support across semesters, including CAD, 3D printing, laser cutting, water jet cutting, CNC machining, and PCBA.

Garg Group

May 2023 – Mar 2025

– Advisor: Prof. Nishant Garg, University of Illinois

- Prototyped a temperature-humidity monitoring sensor array with Arduino and ESP8266, integrating wireless data collection with Firebase.
- Investigated 3D vision reconstruction for measuring concrete mix flow motion using OpenCV and Open3D.

Publication

Gu, X., Gupta, P., Liu, J., Zhou, H., Cisto, B., Khan, M. A., Mason, S., Motl, R., Sebastiao, E., & Hernandez, M. E. *Intelligent Square Stepping Exercise System for Cognitive-Motor Rehabilitation in Older Adults with Multiple Sclerosis. Proceedings of the 2025 Design of Medical Devices Conference*, Minneapolis, MN.

Selected Projects

Autonomous Driving with Static & Dynamic Obstacle Avoidance

Jan 2025 – May 2025

Team: SafeTaxi, ECE484: Principles of Safe Autonomy, UIUC

- Worked on vision-LiDAR fusion algorithms for lane following and various obstacle avoidance scenarios, using the International F1TENTH Autonomous Racing Competition platform powered by NVIDIA Jetson NX.

Object Recognition on Mobile DSP

Aug 2024 – Dec 2024

Team: UIUC Campus Tour Application, ECE420: Embedded DSP Systems, UIUC

- Built an Android mobile app for landmark classification using SIFT feature extraction, K-means clustering, and SVM classification.

Skills

Programming - Python, C++, Java, MATLAB, Linux, Anaconda, Git

CAD & Simulation - KiCAD, Autodesk Fusion 360, SolidWorks

Library & Framework - OpenCV, PyTorch, ROS2, Gazebo