

# Xiaorui Gu

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## Education

<b>University of Illinois Urbana-Champaign</b>	August 2021 – May 2025
Bachelor of Science, Mechanical Engineering   GPA 3.72/4.00	
<b>Northwestern University</b>	Incoming, August 2025
Master of Science, Electrical Engineering	

## Experience

<b>Mobility and Fall Prevention Research Laboratory</b>	June 2024 – February 2025
Carle Illinois College of Medicine, Research Intern (Hardware) – Advisor: Dr. Manuel E. Hernandez, Carle Illinois College of Medicine	
<ul style="list-style-type: none"><li>Developed a piezoresistive pressure sensor array, achieving high sensitivity and durability for walking pattern analysis.</li><li>Designed an interactive LED-based visual aid synchronized with a mobile device UI.</li><li>Tested firmware for precise data acquisition, ensuring reliable sensor integration into the system.</li></ul>	
<b>Bahl Research Group</b>	August 2023 – January 2025
University of Illinois Urbana-Champaign, Undergraduate Lab Assistant – Advisor: Dr. Gaurav Bahl, Department of Mechanical Science & Engineering	
<ul style="list-style-type: none"><li>Designed and constructed experimental setups for a fully levitated 6-DOF system, enabling advanced wireless signal generation.</li><li>Provided manufacturing support across semesters, including CAD, 3D printing, laser cutting, water jet cutting, and PCB soldering.</li></ul>	
<b>Garg Group</b>	May 2023 – March 2025
University of Illinois Urbana-Champaign, Undergraduate Research Assistant – Advisor: Dr. Nishant Garg, Department of Civil & Environmental Engineering	
<ul style="list-style-type: none"><li>Investigated a 3D reconstruction pipeline using OpenCV and Open3D for measuring concrete flow motion.</li><li>Prototyped a micrometer-scale displacement sensor based on capacitance-to-digital converters and analyzed failure reasons.</li><li>Implemented a sensor array for temperature and humidity monitoring (through I2C), integrating data collection with Firebase.</li></ul>	

## Project

<b>Autonomous Driving with Static &amp; Dynamic Obstacle Avoidance</b>	January 2025 – Present
Project Team: SafeTaxi, ECE484: Principles of Safe Autonomy, University of Illinois Urbana-Champaign	
<ul style="list-style-type: none"><li>Developed 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.</li></ul>	

## Skills

**Programming** - Python, C++, Java, MATLAB  
**Frameworks & Libraries** - PyTorch, OpenCV, ROS, Gazebo, Rviz  
**CAD & Simulation** - KiCAD, Fusion 360, SolidWorks, SiemensNX

## Publication

Gu, X., Gupta, P., Liu, J., Zhou, H., Cisto, B., Khan, M.A., Mason, S., Motl, R., Sebastiao, E., & Hernandez, M. E. (2025). Intelligent square stepping exercise system for cognitive-motor rehabilitation in older adults with multiple sclerosis. Proceedings of the 2025 Design of Medical Devices Conference; (In press).

## Honors

James Scholar, University of Illinois Urbana-Champaign  
Division of General Studies (2022), Grainger College of Engineering (2023–2025)