Xiaorui Gu

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Education

University of Illinois Urbana-Champaign August 2021 – May 2025

Bachelor of Science, Mechanical Engineering | GPA 3.72/4.00

Northwestern University Incoming, August 2025

Master of Science, Electrical Engineering

Experience

Mobility and Fall Prevention Research Laboratory June 2024 – February 2025
University of Illinois Urbana-Champaign, Research Intern (Hardware)
– *Advisor: Prof. Manuel E. Hernandez, Carle Illinois College of Medicine*

- Developed a piezoresistive pressure sensor array, achieving high sensitivity and durability for walking pattern analysis.
- Designed an interactive LED-based visual aid synchronized with a mobile device UI.
- Tested firmware for precise data acquisition, ensuring reliable sensor integration into the system.

Bahl Research Group August 2023 – January 2025
University of Illinois Urbana-Champaign, Undergraduate Lab Assistant
– *Advisor: Prof. Gaurav Bahl, Department of Mechanical Science & Engineering*

- Designed and constructed experimental setups for a fully levitated 6-DOF system, enabling advanced wireless signal generation.
- Provided manufacturing support across semesters, including CAD, 3D printing, laser cutting, water jet cutting, and PCB soldering.

Garg Group May 2023 – March 2025
University of Illinois Urbana-Champaign, Undergraduate Research Assistant
– *Advisor: Prof. Nishant Garg, Department of Civil & Environmental Engineering*

- Investigated a 3D reconstruction pipeline using OpenCV and Open3D for measuring concrete flow motion.
- Prototyped a micrometer-scale displacement sensor based on capacitance-to-digital converters and analyzed failure reasons.
- Implemented a sensor array for temperature and humidity monitoring (through I2C), integrating data collection with Firebase.

Project

Autonomous Driving with Static & Dynamic Obstacle Avoidance January 2025 – Present
Project Team: SafeTaxi, ECE484: Principles of Safe Autonomy, University of Illinois Urbana-Champaign

- 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.

Skills

Programming - Python, C++, Java, MATLAB
Libraries & Frameworks - PyTorch, OpenCV, ROS, Gazebo
CAD & Simulation - KiCAD, Autodesk 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)