

# BILL HONG

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## EDUCATION

### University of Michigan

Aug. 2025 – May 2028 (Expected)

B.S Computer Science Engineering & Minor in Mathematics

GPA: 3.98/4.0

- **Relevant Coursework:** Machine Learning, Computer Organization, Data Structures and Algorithms, Linear Algebra (Proof-Based), Probability, Advanced Differential Equations, Honors Multivariable Calculus, Combinatorics
- **Clubs:** Michigan Mars Rover Team
- **Awards:** 1 of 4 recipients of Leinweber Software Scholarship, William J. Branstrom Freshman Prize

## EXPERIENCE

### Mcity

May – Aug. 2026

Software Engineering Intern

Ann Arbor, MI

- Built a camera-LiDAR fusion pipeline for 3D Gaussian Splatting reconstruction of the Mcity test facility in NVIDIA Omniverse NuRec, applying diffusion during training and novel-pose rendering to refine underconstrained regions
- Strengthened response stability and added dataset deletion to an MCP-based agentic LLM interface over auto-labeling and fine-tuning workflows for AV perception

### Mapless AI, a FORT Robotics company

Jan. 2026 – Present

Student Fellow

Ann Arbor, MI

- Designed and implemented an adaptive car-following system on a Mustang Mach-E with automatic lead-vehicle detection and dynamic safe-distance control in Python
- Built a 60 Hz AprilTag pose-estimation pipeline feeding a 20 Hz closed-loop controller, with braking on  $>1s$  detection loss

### Michigan Mars Rover

Aug. 2025 – Present

Perception Team Member

Ann Arbor, MI

- Developed a real-time OpenCV pose estimation algorithm to enable fully autonomous typing via inverse kinematics
- Optimized multi-tag 6-DoF pose tracking via image preprocessing, maintaining  $\leq 5mm$  translation and  $\leq 1^\circ$  rotation error
- Won 3rd place out of 27 teams at the 2026 Canadian International Rover Challenge

### Tandon Machine Learning Summer Program

Aug. 2022

Student

New York, NY

- Built a car recognition model using transfer learning on ResNet-50 in TensorFlow with 95.1% testing accuracy
- Engineered data-augmentation and preprocessing transformations to improve image-classification robustness

## RESEARCH

### ROAHM Lab at University of Michigan

Jun. 2024 – Present

Research Assistant, Advised by Prof. Ram Vasudevan

Ann Arbor, MI

- Developed a risk-aware motion planner, using 3D Gaussian scene representations for spherical collision avoidance
- Formulated trajectory generation as a non-convex NLP, with a high-level planner producing waypoints to improve efficiency
- Achieved 81.2% planning success (+30 points over the best baseline) with 0% collisions across 500 randomized trials
- Co-authored paper on risk-aware motion planning for quadrotors (accepted to IROS 2026)

## PROJECTS

### Lightweight 3D Tree Generation using Lindenmayer Systems

Sept. – Nov. 2025

- Developed procedural tree generation program using L-Systems and a custom string to object converter to create 3D trees with realistic branch patterns in Python
- Utilized a lightweight geometry representation and combined collinear branches, allowing for rapid collision detection

### RRT Path Planning in 2D Environments using Bayesian Optimization

May 2025

- Designed an RRT path planner from scratch in Python with goal-biased sampling and angular steering constraints in obstacle-rich environments, achieving an 85% success rate across 200 randomized 2D environments
- Engineered a Bayesian optimization pipeline that dynamically optimizes navigation parameters via cumulative session logging and regional performance analysis

## TECHNICAL SKILLS

**Programming Languages:** Python, C/C++, Java, MATLAB, HTML/CSS, Bash, LaTeX

**Frameworks & Tools:** PyTorch, TensorFlow, Diffusion Models, OpenCV, ROS2, Gaussian Splatting, Neural Radiance Fields (NeRFs), YOLO, Git/GitHub, Conda, Docker, Slurm, Lmod, VueJS, TypeScript