

Grace Cai

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EDUCATION

University of Maryland, College Park

College Park, MD

Master of Science in Computer Science

Expected Graduation: May 2027

- Coursework: Computational Geometry; Advanced Computer Graphics; Differentiable Programming; Physically-based Modeling, Simulation, and Animation; Machine Learning for Physical Sensing and Perception

University of Maryland, College Park

College Park, MD

Bachelor of Science in Computer Science with High Honors

Aug 2023 – May 2026

- GPA: 3.83/4.00
- Coursework: Object-Oriented Programming, Discrete Structures, Computer Systems, Algorithms, Organization of Programming Languages, Data Science, Artificial Intelligence, Machine Learning, Natural Language Processing, Computational Methods, Compilers, Applied Probability and Statistics, Linear Algebra

University of Maryland, College Park

College Park, MD

Bachelor of Science in Physics

Aug 2023 – May 2026

- Coursework: Multivariable Calculus, Differential Equations, Waves, Classical Mechanics, Electrostatics, Electrodynamics, Optics, Quantum Mechanics, Statistical Thermodynamics, Quantum Computing, Computerized Instrumentation

PUBLICATIONS

[ICRA 2026] **Grace Cai***, Nithin Parepally*, Laura Zheng, Ming C. Lin. “GM3: A General Physical Model for Micro-Mobility Vehicles.” *IEEE International Conference on Robotics and Automation (ICRA)*, 2026.

[IROS 2026] **Grace Cai**, Joey Lee, Nithin Parepally, Laura Zheng, Ming C. Lin. “Differentiable Dynamics for Autonomous Micro-Mobility Navigation.” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2026.

WORK EXPERIENCE

Graduate Research Assistant

Sep 2026 – Present

University of Maryland

College Park, MD

- Leveraging Isaac Sim to test capabilities of LiDAR sensors
- Generating digital twins of mechanical parts to store in database

World Model Systems Engineering Intern, Autonomous Vehicles

May 2026 – Sep 2026

NVIDIA Corporation

Santa Clara, CA

- Developed MagLev workflows to quantify how sensor degradation affects obstacle perception performance
- Built interactive Streamlit dashboard to compare feature-level performance across sensor configurations
- Implemented an AI agent that investigates failures and generates analysis reports using Python and Databricks

Software Engineering Intern, Platform Engineering

Jun 2025 – Aug 2025

Uber Technologies, Inc.

San Francisco, CA

- Implemented multimodal support in Go and Python to analyze images for privacy risks, increasing recall by 25%
- Extended benchmarking suite to assess accuracy and collaborated with stakeholders to design rollout plan
- Built multimodal RAG pipeline to ingest and semantically retrieve images using VectorDB

UberSTAR Software Engineering Intern, Platform Engineering

May 2024 – Aug 2024

Uber Technologies, Inc.

San Francisco, CA

- Utilized Python, Streamlit, and LangChain to build a proof-of-concept tool that summarizes documents
- Collaborated with architects and engineers to write and evaluate LLM prompts for summarization
- Integrated summarization functionality into internal document review platform using Go, TypeScript, and React

PROJECTS

Weapon Watch | *Python, PyTorch, React, Expo, Firebase*

Oct 2024 – Sep 2025

Project Link: gracelcai.github.io/projects/1-weapon-watch

AI-powered weapon detection, notification, and tracking system for schools. Runner-up in xFoundry@UMD's School Safety Xperience Competition, semifinalist in Texas A&M University AI Pitch Competition.

- Coordinated a team of nine students to develop an automated weapon detection and notification app
- Leveraged CUDA on Ubuntu for PyTorch inference on security footage to track weapons and suspects
- Conducted school security market research, created pricing model, and pitched to investors

Scootopia | *TypeScript, Three.js*

Jan 2025 – May 2025

Project Link: micro-mobility-project-website.vercel.app

Traffic simulator that models unsafe behaviors and interactions between vehicles, micro-mobility vehicles, and pedestrians on college campuses.

- Researched data-driven methods to model unsafe behaviors such as jaywalking, speeding, and stop sign violations
- Implemented unsafe behaviors into 3D simulator using Three.js with customizable parameters and road layouts

HONORS AND AWARDS

Computing Research Association (CRA) Outstanding Undergraduate Researcher Award Honorable Mention	2026
Excellence in Research Award	2026
CS Departmental Honors	2023-2026
President's Scholarship	2023-2026
Dean's List	2023-2026

STUDENT ORGANIZATIONS

Robotics at Maryland | *AUV Computer Vision Lead*

Aug 2023 – Aug 2025

- Calibrated fisheye cameras for stereo vision to generate a depth map using OpenCV
- Collected image data and automated labeling process with Roboflow to train YOLO object detection models
- Onboarded new members through checkerboard camera calibration task

TECHNICAL SKILLS

Languages: Python, Go, TypeScript, Java, C, MATLAB

Libraries and Frameworks: PyTorch, OpenCV, LangChain, NumPy, Pandas, Matplotlib, React, Streamlit, Three.js

Developer Tools: Git, VS Code, Linux, Anaconda, Jupyter

Other: LaTeX, Microsoft Excel, Adobe Premiere Pro