# Manav Gagvani

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## Education

**Purdue University** — West Lafayette, IN
*B.S. Computer Engineering, Certificate in Entrepreneurship. GPA:* ***4.0/4.0*** — *Aug. 2024 – May 2027*

**Thomas Jefferson High School for Science and Technology** — Alexandria, VA
*Ranked #1 high school in the U.S., took courses with a focus on Computer Science.* — *Aug. 2020 – May 2024*

## Relevant Coursework

AI 1&2, Reinforcement Learning & Control, Advanced C Programming, Linear Algebra, Microprocessor Systems

## Experience

**Sedaro** — June 2025 – January 2026
*Modeling & Simulation Intern* — *Arlington, VA*

- Led design for a Phase II SBIR ($1.5M) LLM-based decision-support system, integrating Sedaro's aerospace mission simulation to provide real-time wargaming support for military decision-makers.
- Created an automated retrieval engine for internal documentation using LangChain, LangGraph, and ChromaDB with integrations to internal tools. Contributed back bugfixes to the LangChain project.
- Built a simulation of a Golden Dome system mockup that was presented at the Small Satellite Conference.
- Ported astrodynamics and satellite modeling/control code from Python to Rust using Py03, enabling a satellite to operate autonomously without ground communications by modeling its own future state.

**Purdue Digital Twin Lab** — September 2024 – Present
*Research Assistant* — *West Lafayette, IN*

- Developed novel mixture-of-experts ML models to improve interpretability of E2E driving models, decreasing crash rate in simulations by 12% compared to NVIDIA PilotNet. Presented this work at Purdue's Institute for Control, Optimization, and Networks Student Conference as the only undergraduate presenter.
- Harnessed Purdue's distributed computing infrastructure through SLURM for large model training.
- Developed custom driving action tokenizer and fine-tuned a diffusion vision-language-action (VLA) model, achieving state-of-the-art path planning performance on the nuScenes dataset.

**U.S. Naval Research Laboratory** — June 2023 – August 2023
*Research Intern* — *Washington, D.C.*

- Researched collaborative control techniques for decentralized robot swarms which were validated in simulation.
- Created a novel probabilistic multi-agent path planning algorithm and validated it with miniature drones.
- Co-authored and presented this work at the 2024 American Control Conference in July 2024.

**CheckVideo** — June 2021 – August 2021
*Engineering Intern* — *Arlington, VA*

- Developed a web-based monitoring system for remote control of an industrial IoT device using Flask.
- Designed and prototyped laser-cut and 3D-printed parts to alleviate parts shortage, enabling $400,000 in revenue.
- Re-designed existing parts using Fusion 360, enabling an 80% reduction in manufacturing costs.

## Project Teams

**Autonomous Motorsports Purdue** — August 2024 – Present
*President (Prev. Software Lead & Treasurer)*

- Grew team to 70+ students, liaised with graduate students and faculty, and presented at the Purdue Next-Generation Transportation Systems Conference. Raised $5000+ through cold outreach and sponsorships.
- Led the simulations team to 8th place/51 other universities in the AutoDRIVE F1Tenth Simulation Competition, and developed ROS tutorials and scaffolds for novice programmers on the team.
- Fine-tuned and quantized semantic segmentation models and incorporated them into our autonomous driving stack utilizing NVIDIA Jetson, beating the record for best autonomous lap time at Purdue's Grand Prix track.

## Skills & Interests

**Software Development**: Python, C, C++, Rust, Java, MATLAB, Git, ROS2, Docker, Anaconda, uv, PyO3
**Machine Learning/AI**: NumPy, TensorFlow, PyTorch, Transformers, OpenCV, Pandas, SciPy, Matplotlib