Alfred Tang

470-918-7183 | atang302@gatech.edu | linkedin.com/in/alfred-tang | github.com/Randemperson

Education

Georgia Institute of Technology Expected Spring 2028

Bachelor of Science in Computer Engineering | GPA: 3.92 *Atlanta, GA*

- *Relevant Coursework*: Intro to AI, Data Structures and Algorithms, Design and Analysis of Algorithms, Object-Oriented Programming, Programming for Hardware/Software Systems

Experience

Undergraduate Research Assistant Jun. 2026 – Present

IVALab (Prof. Patricio Vela), Georgia Tech *Atlanta, GA*

- Built a seeded evaluation harness benchmarking 8 autonomous driving planners and tracking crash, merge, and runtime metrics; parallelized batch runs across 8 workers with ProcessPoolExecutor, achieving 6.7x faster execution (from 5 min to 45 s)
- Added a CBF-QP safety filter keeping lane-change trajectories physically feasible and enabling continuous merges, while porting an offline MATLAB gap-based planner to a real-time closed-loop Python controller for HighwayEnv; runs a 12 s space-time pipeline in under 4 ms per decision (about 7x faster than an MPC baseline)
- Prototyped acceleration-aware behavior prediction for surrounding vehicles, cutting crash rate 22% and prediction error 55% to 74% with 8% more merges per episode across 500 paired episodes (p less than 0.0001)
- Built a shared JSON scenario format so the MATLAB and Python planners run identical test cases, exposing and fixing a bug in the Python port that dropped valid merge options below the theoretical n+1 bound

Student Researcher Dec. 2025 – Present

Autonomous and Connected Transport Lab VIP, Georgia Tech *Atlanta, GA*

- Built a PPO reinforcement learning agent for autonomous driving in HighwayEnv (Stable-Baselines3), doubling reward from 9 to 19 over 20k timesteps; used for CARLA integration and policy generation
- Fine-tuned transformer language models with Hugging Face Transformers and PyTorch for text comprehension; optimized prompting and preprocessing pipelines, improving ROUGE scores by about 90% over baseline

Restaurant Assistant Manager Jun. 2021 – Aug. 2025

Saigon Cafe *Woodstock, GA*

- Mentored and coordinated 4–5 employees through post-pandemic scaling and the return to full dine-in service

Projects

Brain3D – ImmerseGT Hackathon (1st Place, Spatial Design) | *TypeScript, Snap Lens Studio* Apr. 2026

- Built an interactive AR game prototype for Snap Spectacles featuring hand tracking, surface placement, and real-time physics-based gameplay
- Independently learned Snap Lens Studio, a spatial-computing SDK, within the hackathon timeframe; implemented features using physics, rendering, SpectaclesInteractionKit, and SpectaclesUIKit APIs
- Scripted 7 colored tetromino objects with compound colliders for a procedurally generated 5x5 AR playfield

CV-Controlled Robotic Gripper | *C++, Python, Arduino Nano, MediaPipe, CAD* Feb. 2026 – Apr. 2026

- Developed a computer-vision-controlled robotic gripper integrating MediaPipe hand tracking, Arduino servo control, and custom mechanical assembly
- Processed continuous (about 30 FPS) MediaPipe hand landmark streams to estimate finger angles and translate gestures into low-latency actuator commands for real-time robotic control
- Modified and fabricated silicone-joint gripper components from existing CAD designs, iterating on flexibility and mechanical tolerances for reliable grasping

Chess However Everything is Super Strange (C.H.E.S.S.) | *C#, Unity, Git* Aug. 2025 – May 2026

- Developed a Unity chess strategy game with custom piece behaviors and map layouts in a team Git workflow
- Built Unity Editor tooling with ScriptableObjects and a custom asset pipeline, letting the team define 60+ pieces as data and drive a dynamic GUI without code changes

Technical Skills

Languages: Python, C++, C, C#, Java, JavaScript/TypeScript, MATLAB
Frameworks and Libraries: PyTorch, Hugging Face Transformers, Stable-Baselines3, pandas, NumPy, Pytest
Developer Tools: Git, Linux, Unity, Arduino, Jupyter, Google Colab, Claude Code, Github Actions