Shreepa Parthaje

Chantilly, VA • shreepa.parthaje@gmail.com • (571) 599-6003 • sparthaje.github.io

EDUCATION

University of Virginia Charlottesville, VA | Expected Graduation: May 2025
B.S. in Computer Science, B.A. in Applied Statistics, Minor in Data Science
Relevant Coursework: Autonomous Mobile Robots, Machine Learning, Data Structures and Algorithms, Computer Systems, Software Development • Probability, Multivariable Calculus, Ordinary Differential Equations, Linear Algebra, Discrete Math

Thomas Jefferson HS for Science and Technology Alexandria, VA | August 2017 – May 2021

EXPERIENCE

Teaching Assistant – Computer Systems and Organization, **University of Virginia** Charlottesville, VA | August 2023 – Present
- Direct student learning through labs about logic gates, memory, x86, C, and C++, owning teaching responsibility for 15 students

Autonomy Engineering Intern – Planning & Remote Operations, **Skydio** San Mateo, CA | May 2023 – August 2023
- Developed novel signal in C++ to detect a vehicle's presence in a narrow space by comparing vehicle's commanded movement to sampled gradients and values along a signed distance function, enhancing vehicle awareness of constrained environments
- Leveraged new narrow space signal to eliminate false positives of exiting doorway, rectifying sporadic behavior in expansion of vehicle obstacle margins in complex flights through obstacle dense environments
- Engineered C++ flight software to add pose graph vertices at doorway exits to facilitate vision-based re-localization during automated return-to-home backtracking, resulting in a significant correction of visual inertial-odometry drift of over 1.6 meters
- Improved vehicle's success rate in return-to-home backtracking by 75% through difficult doorways measuring < 2 feet in width
- Analyzed data to build C++ estimator that ingests drone mission specifications to predict generated media storage within 9%

Cloud Consultant Intern, **Amazon Web Services** Herndon, VA | June 2022 – September 2022
- Created web service for auditing cloud architecture against AWS Well-Architected Framework for Fortune 500 workflows
- Revamped CI/CD pipeline with AWS CodePipeline for building, testing, and deploying, replacing 80+ line bash script
- Migrated database to DynamoDB, implementing projection expressions for backend API and speeding page load time by 75%

RESEARCH AND TEAMS

Undergraduate Research Assistant, **Autonomous Mobile Robotics Lab** February 2023 - Present
- Research online learning for energy consumption models considering battery degradation over time and current flight conditions
- Construct YOLOv5 training pipeline in AWS SageMaker for online drone vision-based planning in heterogenous robot systems

Perception and Motion Planning Researcher, **Cavalier Autonomous Racing** | Indy Autonomous Challenge August 2022 – Present
- Design online graph planner for high speed overtakes using optimized race-line trajectory and detected vehicles at >100 mph
- Write RADAR agnostic detection and filtering pipeline in C++ to estimate opponent vehicle pose at distances up to 80 meters
- Investigate SLAM implementations in low-texture race tracks at high-speeds for localization, utilizing solid state LiDAR
- Experiment with OpenPCDet with transfer learning to identify vehicles in LiDAR point clouds, increasing F1 score by 930%

Embedded Software Team Lead, **UVA Solar Car Team** | Formula Sun Grand Prix Competition April 2022 – Present
- Direct team of 21 software engineers leveraging JIRA to develop embedded vehicle software and telemetry visualization suite
- Compute regenerative breaking and acceleration curves for innovative one pedal drive, boosting battery range by 9.6%
- Plan and led debugging process to fix critical faults in uploads to new PCB boards, discovering 1 design fault and 2 short circuits

Embedded Software Engineer, **UVA Solar Car Team** | Formula Sun Grand Prix Competition October 2021 – April 2022
- Debugged critical message discrepancies on CAN bus, prioritizing passenger safety and increasing data reliability by 67%
- Streamline C++ software stack build processes with CMake in Mbed Docker environment, reducing average build time by 30%

PROJECTS

Vertical Take-Off and Landing Aircraft | C++, MATLAB, Python, Fusion360, GitHub
- Modeled environment dynamics to tune PID controller and wrote fast C++ control software, stabilizing craft in winds < 5 m/s
- Simulated Kalman filter to fuse accelerometer and barometer measurements, verifying estimations are accurate within 3%

Othello Artificial Intelligence | Python
- Researched non-deterministic heuristic algorithm applying alpha-beta pruning to choose Othello moves within 5 seconds
- Optimized game state calculations for algorithm using binary operations on bit arrays decreasing calculation speed by ~95%

SKILLS & CERTIFICATIONS

Programming Languages: Python, C++, C, JavaScript, TypeScript, MATLAB, Java, C#, Swift, Bash, Assembly
Libraries: ROS 2, Eigen, NumPy, PyTorch, TensorFlow, Point Cloud Library, OpenCV, Matplotlib, Plotly, React, Django, Flask
Software: Git, Linux, Docker, AWS, Bazel, CMake, Unity, Protobuf, LCM, PostgreSQL, Firebase
Certifications: AWS Developer (Associate), AWS Solution Architect (Associate), AWS Cloud Practitioner