Arjun Rao

(984) 255-5951 | arjun@utexas.edu | linkedin.com/in/rao-arjun | github.com/raorjun | arjun-rao.com

Education

The University of Texas at Austin Expected Graduation: May 2029
B.S. Computer Science, Robotics Honors Program *Austin, TX*

Experience

Software Developer Intern May 2026 – Present
SAS *Cary, NC*

- Building Python automation and performance metrics for Model Studio suite (Visual ML and Forecasting)
- Developing APIs and GAI CoPilot features to support synthetic data generation and analytics pipelines

Vehicle Modeling Engineer September 2025 – Present
Longhorn Racing Electric *Austin, TX*

- Architecting a high-performance simulation pipeline on TACC clusters to execute parallelized Design-of-Experiment (DoE) sweeps, evaluating vehicle variants for optimal lap time sensitivity
- Implemented a nonlinear optimization engine for car selection that processes high-dimensional response surfaces without state-space flattening
- Standardized the team's modeling workflow by integrating Modelica submodules into a unified CI/CD environment, enabling modular subsystem validation and version-controlled vehicle state estimation

Software Engineering Intern June 2025 – August 2025
Kadd Systems *Charlotte, NC*

- Self-directed learning to architect a cost-efficient, event-driven data pipeline on Kubernetes using KEDA and NATS to automatically scale processing jobs from zero, significantly reducing infrastructure costs.
- Developed and containerized a Python ETL processor with Docker that consumes NATS jobs, transforms data with pandas, and writes optimized Parquet files to a MinIO S3 store.

Projects

Bob Dynamics | *Python, Docker, Modelica, Vue, Vitepress* February 2026 – Present

- Engineered an open-source vehicle dynamics framework utilizing SciPy and Modelica to perform DoE sweeps and analyze vehicle performance across a range of vehicle variants
- Developed a "zero-dependency" developer environment via Docker and Make, containerizing the Modelica compiler and Python dependencies to ensure deterministic execution across all platforms
- Launched bobdyn.com as a centralized documentation hub using Vitepress, featuring visualizations and standardized benchmarks for collaborative motorsports development

Autopilot | *Flutter, Python, Flask, Gemini-VLM* January 2026 – April 2026

- Developed a multimodal navigation aid using Gemini VLM and Flutter to provide real-time spatial awareness and audio-based semantic wayfinding for visually impaired users
- Engineered a dynamic localization pipeline using the Tavily API to scrape and correlate building floorplans with live visual landmarks for precise indoor positioning without GPS

Persistent Homology-Guided Image Compression | *Python, Ripser* February 2025 – Present

- Designed a lossy image compression framework that applies persistent homology from topological data analysis (TDA) to preserve structurally meaningful features while removing insignificant frequencies.
- Combined Fourier transforms with homology-based ranking of frequency components to improve noise robustness, and co-authored a preprint paper presenting experimental comparisons against JPEG.

Technical Skills & Honors

Languages: Python, C/C++, Java, Kotlin, Modelica, JavaScript/TypeScript, Dart
Frameworks: Vue, React, Flask, ROS2, Flutter, SciPy, TensorFlow, PyTorch, PlatformIO
Cloud & Infrastructure: Docker, Kubernetes, KEDA, NATS, AWS S3, Redis, Linux/Unix, CI/CD
AI & Robotics: VLM Integration, Sensor Fusion, OpenCV, PDDL, Control Systems
Honors: Robotics Honors Program, Solana Track Winner @ Freetail Hackers Spring 2026, Finalist @ Momentum Spring 2026 Buildathon