

Srikar Gouru

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EDUCATION

University of Virginia

Charlottesville, Virginia | May 2025

- **Degree:** B.S. in Computer Science and Cognitive Science with Mathematics Minor.
- **GPA:** 3.94 / 4.00.
- **Coursework:** Autonomous Systems, Reinforcement Learning, NLP, Artificial Intelligence, Algorithms, Computer Architecture, Discrete Math, Advanced Cybersecurity, Differential Equations, Probability, Multivar Calculus, Linear Algebra.

Thomas Jefferson HS for Science and Technology

Alexandria, Virginia | June 2021

PROFESSIONAL EXPERIENCE

Zipline | Autonomy Intern

San Francisco, CA | May 2024 - Aug 2024

- Implemented a multimodal search-based Global Planner capable of long-range replanning to avoid deadlocks and reach emergency docks while optimizing energy consumption, avoiding intruders, and maintaining dynamics constraints.
- Refactored simulation suite to allow more generic scenarios with varying planner, controls, and environment configurations.
- Programmed custom Dubins library with 2D shortest path algorithm and random path generation.

Zipline | Flight Routes Intern

San Francisco, CA | May 2023 - Aug 2023

- Developed optimal A* Search on 2D and 3D lattices and experimented with Grid, Quadtree, and Framed Quadtree lattices.
- Devised path optimization algorithms using Gradient Descent and Simulated Annealing techniques and tuned hyperparameters.
- Created a benchmarking suite with Matplotlib visualization and cProfiling to compare search and optimization algorithms.

SpaceX | Starship Control Software Intern

Los Angeles, CA | May 2022 - Aug 2022

- Spearheaded development of a secure browser-based software deployment system to notify hardware operators of software updates and removing dependence between developers and operators, speeding up hardware test iteration cycles by 10x.
- Implemented versioning in control software to provide operators with software release summaries and enable software reverts.
- Devised a communication protocol between processes to monitor deployments and detect failures, improving system robustness.
- Overhauled the central backend database to be persistent to provide redundancy and not propagate blackouts.

RESEARCH

Cavalier Autonomous Racing | Motion Planning Lead

May 2022 - Present

- Designed an online spatiotemporal graph planner to optimize overtakes while maintaining dynamics constraints, following race regulations, and avoiding opponents.
- Created a DFA state machine to strategize overtake locations and timings in multi-agent environments.
- Applied GPU acceleration with CUDA and PCL to optimize Clustering run on LiDAR point clouds.
- Developed a probabilistic online stitching algorithm to predict opponent trajectory based on historical odometry and uncertainty data from previous laps.
- Implemented a race-ready adaptive cruise control technique utilizing model predictive control and opponent prediction uncertainty.

Chandra Robot Autonomy Lab | Undergraduate Researcher

Aug 2024 - Present

- Developed *LiveNet*, a robust neural network that generates collision-free and deadlock-free trajectories in constrained environments.
- Created a modular simulation environment with double-integrator dynamics and automatic benchmarking of metrics such as time-to-goal, deadlock frequency, and path deviations on custom-generated test suites.

UVA Biocomplexity Institute | Undergraduate Researcher

Oct 2021 - May 2022

- Applied NLP techniques to isolate descriptive tags for sentences in Harry Potter texts and used K-Means++ and DBSCAN algorithms in scikit-learn to cluster sentence data vectorized by SBERT.
- Derived constraints for Integer Linear Programming in Gurobi to compute optimal descriptor groups and classify each cluster.

PUBLICATIONS

LiveNet: Robust, Minimally Invasive Multi-Robot Control for Safe and Live Navigation in Constrained Environments

Preprint December 2024

Submitted to LADC 2025

PROJECTS

CodingClash RTS Game Competition

October 2020

- Organized a custom real-time strategy game contest where 40+ users created Python AIs to compete against one another.
- Built a secure, scalable game engine utilizing RestrictedPython to evaluate code and hosted it with Django and PostgreSQL.
- Automatically scheduled and tracked games with Redis and Celery while updating live elo rankings on a ReactJS frontend.

Rubik's Cube Robot

March 2019

- 3D printed a housing for 6 stepper motors and 6 connectors to rotate a cube's faces, surpassing speeds of 10 turns per second.
- Applied CV techniques with four cameras to capture the cube's initial state and displayed it through an interactive JS GUI.
- Programmed CFOP and Kociemba algorithms in Python and controlled motors via Arduino, achieving < 4-second solve times.

TEACHING ASSISTANT

Computer Systems and Organization

Sept 2022 - May 2024

- Teaching lab sections and guiding students through labs
- Holding office hours and answering questions in person and on Zoom.
- Writing and grading assignments and exams

AWARDS

- **Mid-Atlantic International Collegiate Programming Competition** - 3rd in Site 2023
- **Mid-Atlantic International Collegiate Programming Competition** - 2nd in Site 2024
- **Collegiate Cyber Defense Competition** - 2nd in Regionals, 8th in Nationals 2022

KEY SKILLS

- **Languages:** Python, Rust, C++, C, CMake, Java, Bash, MATLAB, Arduino, JavaScript, Typescript, Assembly, HTML, SQL.
- **Libraries:** TensorFlow, PyTorch, OpenCV, PCL, Matplotlib, Gurobi, Shapely, Scikit-Learn, NumPy, Django, Flask.
- **Technologies:** Git, Linux, ROS 2, Bazel, CI/CD, Docker, gRPC, Protobuf, MySQL, PostgreSQL, React.js, Firebase, Boost.