Srikar Gouru

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EDUCATION

Carnegie Mellon University Pittsburgh, Pennsylvania | May 2027

- **Degree:** M.S. in Robotics
- **GPA:** 4.00 / 4.00
- **Coursework:** Planning & Decision Making, Multi-Robot Planning, Fundamentals of CV, Robotic Mechatronics

University of Virginia Charlottesville, Virginia | May 2025

- **Degree:** B.S. in Computer Science and Cognitive Science
- **GPA:** 3.95 / 4.00
- **Coursework:** Autonomous Systems, Reinforcement Learning, NLP, Artificial Intelligence, Computer Architecture, Discrete Math, Advanced Cybersecurity, Differential Equations, Probability, Multivar Calculus, Linear Algebra

PROFESSIONAL EXPERIENCE

Zipline | Autonomy Intern San Francisco, CA | May 2024 - Aug 2024

- Implemented a multimodal search-based Global Planner for long-range replanning and deadlock avoidance to reach emergency docks while optimizing energy consumption, avoiding intruders, and maintaining dynamics constraints
- Refactored simulation suite to genericize 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 and experimented with Grid, Quadtree, and Framed Quadtree lattices in 2D and 3D
- Devised discrete path optimization algorithms based on Gradient Descent and Simulated Annealing techniques
- Created a benchmarking suite with cProfile and Matplotlib to compare and visualize pathfinding 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 devs and operators, speeding up test iteration cycles by 10x
- Implemented versioning in control infrastructure software to provide operators with software release summaries and enable software reverts
- Devised an inter-process communication protocol to monitor and log deployments, improving system robustness
- Overhauled the central backend database to be persistent to provide redundancy and not propagate blackouts

RESEARCH

ARCS Lab | Graduate Researcher Carnegie Mellon University | Aug 2025 - Present

- Formulated a scalable hierarchical search algorithm for multi-agent grid-based search and rescue with online task discovery, incremental search techniques, and anytime replanning
- Accelerated optimal multi-agent grid surveillance by 500x using efficient cell pruning, parallelization, and mTSP-based heuristics
- Developed Minimax Weighted A* (MxWA*), a bounded suboptimal search algorithm for problems with makespan or min-max objective functions

Cavalier Autonomous Racing | Motion Planning Lead University of Virginia | May 2022 - May 2025

- Designed an online spatiotemporal graph planner to optimize overtakes while maintaining stable vehicle control, following race regulations, and avoiding opponents
- Created a discrete state machine to strategize overtake locations and timings in multi-agent environments
- Developed a probabilistic online position-stitching algorithm to predict opponent trajectory based on historical odometry and uncertainty data from previous laps
- Implemented a race-ready adaptive cruise control algorithm utilizing model predictive control

- Developed a simulation environment with accurate vehicle dynamics in Python using Numpy and JAX, and created a custom suite of scenarios to benchmark the speed and effectiveness of various planning algorithms.

Chandra Robot Autonomy Lab | Undergraduate Researcher University of Virginia | Aug 2024 - May 2025
- 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 University of Virginia | 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 minimally describe and classify each cluster

PUBLICATIONS

Scalable Algorithms with Provable Optimality Bounds for the Multiple Watchman Route Problem | Srikar Gouru, Ariel Felner, & Jiaoyang Li
Submitted to ICAPS 2026 December 2025

LiveNet: Robust, Minimally Invasive Multi-Robot Control for Safe and Live Navigation in Constrained Environments | Srikar Gouru, Siddharth Lakkoju, & Rohan Chandra
Proceedings of the 7th Annual Learning for Dynamics & Control Conference, in *PMLR* 283:946-958.
Accepted into L4DC 2025, Poster Presentation June 2025

PROJECTS

CodingClash RTS Game Competition October 2020
- Organized a custom real-time strategy contest where 40+ users created Python AIs to compete against one another
- Built a secure, scalable game engine utilizing RestrictedPython for code evaluation and hosted it with a Django and PostgreSQL backend
- Automatically scheduled ranked games with Redis & Celery while updating live elo rankings on a ReactJS frontend

Rubik's Cube Robot March 2019
- Programmed CFOP and Kociemba algorithms in Python. Also utilized CV techniques with four cameras to capture the cube's initial state and developed an interactive JS GUI for debugging and algorithm iteration
- 3D printed a housing for 6 stepper motors and connectors to rotate a cube's faces, surpassing speeds of 10 turns / second and achieving < 4-second solve times

TEACHING ASSISTANT

Computer Systems and Organization, University of Virginia Sept 2022 - May 2024
- Teaching lab sections, guiding students through labs, and holding office hours
- Writing and grading both written and coding assignments / exams

HONORS / AWARDS

- **Dean's List** Fall 2021 - Fall 2023, Fall 2024, Spring 2025
- **MIT Battlecode Finalist** 2025
- **Mid-Atlantic International Collegiate Programming Competition** - 2rd in Site 2023 - 2024
- **Collegiate Cyber Defense Competition** - 2nd in Regionals, 8th in Nationals 2022

KEY SKILLS

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