

# Sairam Vaidya Mahadeva Ganapathy

[sairam2661.github.io](https://sairam2661.github.io) [linkedin.com/in/sairamvaidya](https://www.linkedin.com/in/sairamvaidya) [smahadevaganapathy@ucsd.edu](mailto:smahadevaganapathy@ucsd.edu) [+1 619 650 2654](tel:+16196502654)

## EDUCATION

- **University of California, San Diego** San Diego, CA  
*M.S. in Computer Science* (GPA: 3.91/4.0) *Sep. 2024 – Exp. Jun. 2026*
- **P.S.G. College of Technology** Coimbatore, India  
*B.E. in Computer Science and Engineering* (CGPA: 9.70/10.0) *Jun. 2019 – May 2023*

## RESEARCH EXPERIENCE

- **Loris Research Lab, UC San Diego** San Diego, CA  
*Graduate Student Researcher | Advisor: Loris D'Antoni* *Jan. 2025 - Present*
  - Developed a dialect-agnostic fuzzing framework for MLIR compilers, achieving 10-120% coverage improvement and discovering 88 previously unknown bugs.
  - Developed constrained sampling algorithms for language models, including MCMC and adaptive rejection sampling variants for grammar-constrained generation.

## PUBLICATIONS

- **Bootstrapping Fuzzers for Compilers of Low-Resource Language Dialects Using LMs**   
*arXiv Preprint | S. Vaidya, M. Böhme, L. D'Antoni*
- **Constrained Adaptive Rejection Sampling**   
*arXiv Preprint | P. Parys, S. Vaidya, T. Berg-Kirkpatrick, L. D'Antoni*
- **Constrained Sampling for Language Models Should Be Easy: An MCMC Perspective**   
*NeurIPS 2025 | E. Anaya Gonzalez\*, S. Vaidya\*, K. Park, R. Ji, T. Berg-Kirkpatrick, L. D'Antoni*

## SELECTED PROJECTS

- **Stateful Authorization for Model Context Protocol Servers**   
*Python, Cedar Policy Language, MCP* *Fall 2025*
  - Developed a stateful authorization framework for AI agents interacting with external services via MCP, using task-specific policies and state-aware evaluation.
  - Achieved 90% accuracy in blocking unauthorized operations compared to 42.5% for stateless baselines on a GitHub MCP server case study.
- **Convex IRL: Inverse Reinforcement Learning**   
*Python, Convex Optimization, Reinforcement Learning* *Winter 2025*
  - Implemented convex formulation of inverse reinforcement learning with global optimality guarantees, addressing non-convexity challenges in traditional maximum entropy IRL approaches.
  - Demonstrated robustness to noisy expert demonstrations through convex relaxation techniques, enabling reliable reward function recovery in continuous state-action spaces.
- **SemGuS-LENS: LLM-Guided Program Synthesis**   
*Python, Lisp, PyTorch, Program Synthesis* *Fall 2024*
  - Bottom-up enumerator for Semantic-Guided Synthesis (SemGuS) that combines probabilistic enumeration with iterative PCFG refinement.
  - Integrated LLM feedback to dynamically adjust grammar production weights, improving synthesis efficiency for under-specified semantic constraints.

## INDUSTRY EXPERIENCE

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- **Morgan Stanley** Bengaluru, India  
*Technology Associate* Jul. 2023 - Aug. 2024
  - Contributed to CVA pricing analysis engine for derivatives trading, optimizing performance of risk calculation pipelines to support real-time valuation across FX and commodity products.
  - Architected GDPR-compliant data anonymization framework using microservices with containerized deployments, scaling to handle 150K records/sec across 46 enterprise systems (Best Project Award, 2024).
- **Morgan Stanley** Bengaluru, India  
*Technology Analyst Intern* Jan. 2023 - Jun. 2023
  - Engineered real-time Quote Tool for pre-trade pricing analysis of IR products (FX Options, Forwards), automating manual analysis process from 1-2 days to ~10 seconds.
- **J.P. Morgan Chase & Co.** Mumbai, India  
*Software Engineer Intern* Jun. 2022 - Jul. 2022
  - Developed low-latency microservices for trading systems, optimizing database refresh operations and implementing automated testing to ensure data consistency and system reliability in production environments.

## SKILLS

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- Python, Scala, C++, PyTorch, MLIR, LLVM, Constrained Decoding, Grammar-Based Fuzzing, LLM Inference (vLLM, Transformers), SMT Solvers, Program Synthesis

## TEACHING EXPERIENCE

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- **Teaching Assistant:** CSE 20 - Discrete Mathematics, UC San Diego (Fall 2025)
- **Teaching Assistant:** CSE 20 - Discrete Mathematics, UC San Diego (Summer 2025)

## AWARDS & HONORS

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- **Silver Medalist (2nd Rank, Department):** P.S.G. College of Technology (2023)
- **iHub-Data Mobility Fellowship:** Indian Institute of Information Technology (2022)