

# Saarang Srinivasan

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## EDUCATION

### Purdue University

Bachelor of Science in Computer Science

GPA: 3.94

West Lafayette, Indiana

**Concentrations:** Machine Intelligence, Algorithms

**Relevant Coursework:** Data Structures & Algorithms, Data Mining & Machine Learning, Operating Systems, ML Systems (Grad), Motion Planning (Grad), Introduction to AI, Randomized Algorithms (Grad), Advanced Theory of Algorithms, Systems Programming, Reasoning About Programs (Grad), Theory of Computation.

## EXPERIENCE

### AI/ML Engineering Intern

Avoca AI (YC '23)

Dec 2024 – Jan 2025

New York, NY / Remote

- Analyzed and classified call transcripts using advanced NLP models (DeBERTa, RoBERTa, LongFormer).
- Optimized and bench-marked AI phone agent performance across customers by analyzing 'bad calls'.
- Designed a hierarchical classification system with 95.22% test accuracy using PyTorch, Supabase, Pandas.

### Software Engineering Intern

Collins Aerospace / Raytheon Technologies

May 2024 – Aug 2024

Cedar Rapids, IA

- Built and certified flight control software for the military Boeing KC-46 Pegasus.
- Designed and implemented a new hardware configuration format for KC-46 Pegasus start-up, reducing file size by 72%.
- Created C/C++ tests to verify correctness of flight software based on composition analysis and MC/DC coverage.
- Automated data parsing and tracking using Python and ML techniques, improving speed and accuracy by 30%.

### Software Engineering Intern

Hacklab Solutions Pvt Ltd

May 2023 – June 2023

Bangalore, India

- Built containerized AI product architecture with server/client modules using Docker and Kubernetes for rapid deployment.
- Designed a main server integrated with a AI workers, front-end dashboard, supporting Postgres/Redis for persistent storage.
- Implemented self-healing nodes, CI/CD pipelines, and load balancing, ensuring scalability (MLOps/DevOps).
- Optimized memory accesses, boosting deployment speed by 80% and reducing latency by 30%.

## PROJECTS

### GNN Cost Model for Tensor Program Optimization | PyTorch Geometric, TVM, NLP, Multithreading

Nov 2024

- Designed a Graph Neural Network (GNN)-based cost model to predict runtime of tensor programs.
- Integrated into TVM's search framework, model auto-optimizes tensor programs for deep learning on NVIDIA V100 GPUs.
- Engineered features from TensorIR Abstract Syntax Trees (ASTs) using FastText embeddings trained on random walks.
- Surpassed existing runtime prediction model XGBoost's accuracy and validated model on the TenSet dataset.
- Slides: <https://tinyurl.com/GNN-Project>, trying to publish

### Pulse - Convert Lectures to TikToks | Next.js, Flask, PyTorch, OpenCV, Firebase, MongoDB

Jan 2024

- Developed a React.js web app to convert lecture videos/slides into TikTok-style clips, summarizing key topics.
- Built a robust two-layer MongoDB/Firebase DB architecture to increase video generation speed by 80%.
- Integrated with React Native iOS app for viewing generated videos, including deepfake videos and tweet summaries.
- Utilized OpenAI's Whisper API and Modal/PyTorch for video processing and Firebase/MongoDB for data storage.

### TinyVerify: Translation Validation for Tinygrad | Z3 SMT Library, Formal Verification, ML Compilation

Nov 2024

- Built translation validation framework for the Tinygrad ML Compiler using SMT solvers (Z3).
- Verified correctness of GPU kernel optimizations on the Tinygrad Intermediate Representation.
- Extended support for ALU/memory ops, FP/int/vector types, enabling rigorous formal verification.
- Added support for GPU-specific thread variables and CPU control flow and range operations.
- Slides: <https://tinyurl.com/tinyverify>, trying to publish

## HONORS & AWARDS

**Gold Medalist:** Indian National Olympiad in Informatics 2022 (Top 10 in India).

**ICPC Regionals:** Rank 18 representing Purdue in the ACM International Collegiate Programming Contest Regionals 2022/23.

**International Olympiad in Informatics Training Camp:** Top 30 in India to be selected in 2021 and 2022.

## TECHNICAL SKILLS

**Languages:** Python, C/C++, Java, JavaScript, Unix, R, MATLAB, ARM/x86, HTML/CSS, Rust

**Frameworks/Tools:** Pandas, Open-CV, Torch, DGL, Docker, Kubernetes, SQL, Flask, Firebase, Git, React.js, AWS, Linux

**Certifications:** MITx: 6.431x Probability and Uncertainty of Data, Data Structures & Algorithms Certification by CodeChef

**Fields:** System for ML, NLP, Machine Learning, Computer Vision, Full Stack Development, Algorithms

## ACTIVITIES

**Course Development:** CS381 Analysis of Algorithms (Fall '24, 400+ students), CS182 Discrete Math (Spring '24, 800+ students)

**Teaching Assistant:** CS381 (Fall '24), CS182 (Spring '24), CS311 Competitive Programming 2 (Spring '23)

**Research:** With Dr. Simina Branzei on developing reinforcement learning algorithms for the repeated fair division problem.

**USACO Tutor:** Instruct Bay Area students in advanced algorithms for the USA Computing Olympiad with X-Camp Academy

**Club Treasurer/Officer:** Competitive Programming Union Club 2023-2024