Harsh Vardhan Singhal

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Education

University of Illinois, Urbana-Champaign — Urbana, IL
Bachelor of Science in Mathematics and Computer Science (Current GPA: 3.86/4.00) — *Aug 2022 – May 2025*

- Dean's List Recipient for Fall 2022 Semester
- Relevant Coursework: Data Structures, Algorithms, Computer Systems, Discrete Structures, Probability and Statistics, Applied Machine Learning, Deep Learning for Computer Vision, Fundamental Mathematics, Computational Linear Algebra, Differential Equations, Competitive Programming

Technical Skills

Languages: Java, Python, C++, MongoDB, SQL (Postgre, MySQL), JavaScript, TypeScript, HTML/CSS

Frameworks: React, Next.js, Node.js, Tailwind, AngularJS, Flask, Flutter, Bootstrap, Hadoop, Spark, Elasticsearch, Nagios

Libraries: Pandas, NumPy, Matplotlib, scikit-learn, TensorFlow, PyTorch, Django

Technologies & Softwares: Linux, Apache Kafka, Nginx, AWS, Kubernetes, GitLab, Docker

Experience

ML Research Intern — Aug 2024 - Present
National Center for Supercomputing Applications (NCSA), UIUC — *Urbana, IL*

- Implementing an automated model selection feature within DRYML, which uses performance metrics and cross-validation to suggest the best model, optimizing model performance and reducing manual tuning time
- Integrated MLFlow into DRYML, enabling real-time visualization of training, improving model performance monitoring

Course Assistant for CS 222 (Software Design Lab) — Aug 2024 - Present
University of Illinois, Urbana-Champaign — *Urbana, IL*

- Overseeing two teams of 5 students each, conducting weekly standups, guiding project development, and using Agile practices

ML Research Intern — May 2024 – Aug 2024
Lenovo Research Lab — *Morrisville, NC*

- Refactored model training script from TensorFlow 2 to PyTorch and added GPU parallelization, reducing training time by 35% (10 to 6.5 days)
- Developed and optimized image segmentation algorithms to improve accuracy of object detection and classification in low-light conditions
- Developed an automated monitoring system that detects and mitigates training anomalies, reducing model training failures by 40% and saving approximately 50 hours of manual troubleshooting

Software Engineer — Oct 2023 – Present
Disruption Lab, University of Illinois at Urbana-Champaign — *Urbana, IL*

- Built full-stack app for OSF Healthcare, enabling secure anonymized patient data exchange using PrivateSQL and MongoDB
- Fine-tuned LLM for Yield Protocol by optimizing hyperparameters and neural architecture, evaluated with AgentBench

Data Engineering Intern — Jun 2023 – Aug 2023
Aviana Global Technologies Inc. — *Yorba Linda, CA*

- Developed data cleaning web-app, improving dataset integrity by 40% using deduplication and normalization techniques
- Conducted thorough data analysis and rectified inconsistencies, errors, and outliers in company datasets

Course Assistant for CS 124 (Programming in Java) — Jan 2023 – May 2023
University of Illinois at Urbana-Champaign — *Urbana, IL*

- Recorded 10+ coding tutorials to teach fundamental OOP concepts in Java to 400+ students

Software Development Intern — Apr 2021 – Sept 2021
Enterprise Science and Computing (ESAC, now ICF) — *Rockville, MD*

- Improved a CDAP-based bioinformatics pipeline by incorporating data harmonization, boosting efficiency by 30%

Programmer Intern — May 2019 – Jun 2019
Tata Institute of Fundamental Research (TIFR) — *Mumbai, MH*

- Analyzed X-Ray data with Large Area X-Ray Proportional Counter and enhanced a Java module, boosting efficiency by 1.8x

Projects

TravelFast | *Python, Linux, Flask, MySQL, OpenStreetMaps, Hadoop, Spark, Kafka* — Aug. 2023

- Co-developed a web-app using four algorithms to find the "best" route for travelers with multiple destinations
- Experimented with Hadoop, Spark, and Kafka to enhance algorithmic computations and designed responsive interfaces using Tailwind, improving user accessibility and interaction.

CovHelp | *MySQL, JavaScript, Nagios, Elasticsearch, HTML, CSS* — Apr. 2021

- Site provided real-time bed, oxygen, and medicine availability during the COVID-19 wave in 04/2021; 15K+ hits
- Utilized Nagios for real-time updates and Elasticsearch for efficient data retrieval