Tanishq Agarwal

Bachelors in Technology
Computer Science & Engineering
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Education

- **B.Tech in CSE**, IIIT Hyderabad — CGPA: Overall 8.54/10, Major **9.00/10** Oct 2022 – Present
  - Awarded the **Dean's List** in Monsoon'23 and Spring'25 semesters for academic excellence.
- **Senior Secondary (Class 12)**, Urmi School — **94%** 2022
- **Secondary (Class 10)**, Mount Litera Zee School — **92.6%** 2020

Experience

- **Google** *May 2025 – August 2025*
  Software Engineering Intern Bangalore, India
  - Architected and implemented a comprehensive bloat management system for **PostgreSQL**, enhancing database performance and observability. The solution delivered up to **11.3% higher transaction throughput (TPS)**, **16.5% lower p95 latency**, and **38% reduced table bloat** in benchmark tests.
  - Engineered advanced database tuning agents using **Machine Learning**, employing **Reinforcement Learning (RL) and Bayesian Optimization** (BO & MOBO) to automatically find optimal PostgreSQL configurations, balancing the trade-off between maximizing TPS and minimizing storage bloat.
  - Authored high-performance **PostgreSQL extensions** in C (bloatprioritizer) to intelligently reorder autovacuum tasks based on **real-time bloat** estimates, significantly improving maintenance efficiency.
  - Built end-to-end monitoring and infrastructure components, including a Go watcher in the Cloud SQL agent, Python metric-exporting scripts, and **automated** extension installation, to provide customers with crucial **visibility into bloat** and performance via **Google Cloud Monitoring**.
- **Products Lab - IIITH** *Jan 2024 – Apr 2024*
  Software Engineering Intern Hyderabad, India
  - Developed a **multilingual** (9 languages) mobile app enabling users to offer free clothes, food, and accommodation with details (quantity, description, timings, photos). Integrated **Google Maps API** for location visualization and navigation.

Projects

- **Deep Learning based CampusVision-AI |**
  Python, PyTorch, CNNs, Transformers, OpenCV, Ensemble Methods
  - Engineered a multi-task deep learning pipeline using **DINOv2** and **CNN/Transformer** backbones to predict spatial metadata (latitude, longitude, camera orientation, Region) from 5K+ campus images, supporting localization tasks.
  - Enhanced model robustness via MixUp, CutMix, and perspective warping; used ensemble strategies to achieve **<18° angular error**, **>97% region classification accuracy**, and lowest MSE in geo-coordinate prediction.
- **Network File System (NFS) |**
  C, Networking, Concurrency, Modular Programming, Git
  - Engineered a **fault-tolerant distributed file system** enabling seamless access across 8 servers, scaling to support **32+ concurrent users** with **high availability**.
  - Integrated **TCP/IP**-based communication, **asynchronous file duplication** across servers, and **failure detection** mechanisms to ensure **>99% system uptime** and support **fault recovery** within 3 seconds during node failure.
- **Custom Unix Shell |**
  C, POSIX API, OS, Linux, Shell, Concurrency
  - Designed and implemented a **feature-rich Unix shell** in C supporting background process execution, pipelining, and persistent command history; optimized process management to improve CLI automation **efficiency by ∼20%**.
- **Dynamic Replication in Google File System |**
  Python, Concurrency, Load Balancing, Dynamic Replication
  - Constructed a scalable distributed file system managing **128** file chunks across **16** servers. Features **dynamic replication** and **load balancing** with **3** replicas per chunk, using **multi-threading** and asyncio to handle concurrent client-server communication.
  - Enhanced fault tolerance and performance, boosting system efficiency by **40%** for reliable data storage and retrieval.

Technical Skills & Leadership

- **Teaching Assistant**: Led tutorials, Assessments and labs for **700+ students** in Data Structures & Algorithms and Computer programming.
- **Programming Languages**: C, C++, Python, Go, Bash, Assembly, SQL
- **Technologies**: Linux, PostgreSQL, Flask, React, Node JS, MongoDB, Flutter
- **Courses**: Statistical Methods in AI, Data Analytics, Language Models & Agents, Distributed Systems, Operating Systems & Networks, Data Structures & Algorithms, Algorithm Analysis & Design, Design & Analysis of Software Systems

Achievements

- **ACM-ICPC Regionalist 2024–25** Secured **All India Rank 83** in the first round out of 3000 teams.
- **IICPC Regionalist 2024–25** Ranked **196** in CodeFest'25 Prelims.
- **Codeforces** Rated **1779 (Expert)** on **Codeforces** (**Top 500** in India)
- **CodeChef** Maintained a **Top 1000** global ranking on **CodeChef**, achieving a top rating of **2092 (5 star)**.
- **Contest Rank** Secured Global Ranks of **12**, **20**, **75**, **88** in Codechef Starters 167, 110, 124, 125
- **JEE Mains** Secured **AIR 775** from more than 1 million candidates (Among top 0.1%)
- **JEE Advanced** Secured **AIR 2230** from more than 200K candidates (Among top 1%)