

# Nitish Malluru

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## EDUCATION

### Texas A&M University

*Bachelor's of Science, Computer Science*

College Station, TX

Aug 2022 — May 2026

- **Cumulative GPA:** 3.93/4.0
- **Relevant Coursework:** Operating Systems, Networking, Distributed Systems, Computer Architecture, Compiler Design, Digital Electronics, Competitive Programming, Deep Learning, Natural Language Processing, Computer Graphics

## SKILLS

- **Languages:** C, C++, Python, Java, JavaScript, TypeScript, HTML, Emscripten, ARM Assembly, Verilog HDL, Elixir, Bash
- **Frameworks:** React, React Native, Svelte, SvelteKit, Tailwind CSS, NodeJS, ExpressJS, Selenium, TensorFlow, Sklearn, PyTorch, NumPy, Pandas, Matplotlib, LangChain, Pgvector, Postgres, SQL, MongoDB, OpenGL
- **Platforms:** Linux, Unix, Docker, Docker Compose, AWS, Azure, Render, Google Colab, Git, GitHub Actions, Bitbucket Pipelines, Apache Hadoop, RabbitMQ, FPGA, Keil uVision

## EXPERIENCE

### Amazon | Software Engineering Intern

May 2025 — Aug 2025

- Improved debugging accessibility for 2,000+ developers, QA testers, and beta customers by building a cross-platform C++ visualization tool compiled with Emscripten to WebAssembly for deployment across native, web, and smart TV clients
- Streamlined game stream monitoring by consolidating insights from 20+ client subsystems into a unified interactive overlay visualizing controllers, cursors, and session provisioning state
- Enhanced streaming analysis by engineering C++ preprocessing pipelines that surfaced WebRTC metrics including jitter, packet loss, bitrate, frame rates, and latency on interactive timeline graphs with ImGui and ImPlot

### Dell | Software Engineering Intern

May 2024 — Aug 2024

- Reduced BIOS troubleshooting time 50% by building an AI chatbot with a self-hosted Ollama Llama 3.1 model, containerized with Docker and integrated via LangChain for on-premise inference
- Improved error detection accuracy 35% by leveraging a Retrieval-Augmented Generation system that analyzed BIOS logs using nomic-embed embeddings and a pgvector database for efficient indexing and retrieval
- Consolidated disparate BIOS toolsets into a single Django-powered chatbot, providing an extensible AI-powered debugger adopted by all six BIOS engineering teams

### Arborworx | Founder

May 2022 — Dec 2023

- Accelerated client data extraction 20x by engineering a multi-threaded web scraper that leveraged a single authentication cookie to enable concurrent browser sessions for automated dashboard data collection with Selenium
- Processed over 100,000 PDFs by designing robust parsing pipelines built with Apache PDFBox to handle complex document structures and recover from errors without manual intervention

## PROJECTS

### Optimizing Compiler for DLX (RISC)

- Built a complete compiler with recursive descent parser, SSA-based IR, and control flow graphs to enable dead code elimination, constant folding, constant propagation, copy propagation, and common subexpression elimination
- Implemented a Chaitin-style graph coloring register allocator with spill cost heuristics to map unbounded virtual SSA registers to the fixed DLX physical set
- Generated DLX assembly by implementing stack frame management, function prologues/epilogues, and back-patching branch targets

### Clustered Social Network

- Architected a multi-cluster distributed system using Docker Compose to orchestrate isolated service deployments with gRPC-based client-server communication, partitioning clients across clusters for load distribution and geographic scalability
- Implemented heartbeat-based leader election enabling automatic promotion of standby nodes to active on node failure, maintaining availability for both client-facing servers and backend synchronizers
- Designed cross-cluster state replication using RabbitMQ publish-subscribe queues to asynchronously propagate follower relationships and timeline posts, protecting concurrent file I/O with named semaphores

## AWARDS

- **President Endowed Scholar** — Highest merit scholar awarded to student attending Texas A&M
- **Eagle Scout** — Highest rank in Boy Scouts of America
- **USACO Gold** — Top 4% of competitive programmers nationwide