Nitish Malluru

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Education

Texas A&M University College Station, TX
Bachelor's of Science, Computer Science *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

16-bit CPU

- Built a complete 16-bit computer from logic gates up, manually constructing the ALU using cascaded 4-bit adders and a 3-port register file for the datapath
- Designed a hardwired control unit to decode custom ISA opcodes and a load-store unit to handle memory transactions and memory-mapped I/O via a unified bus
- Integrated CPU, RAM, and ROM into a working single-cycle system and validated correctness by executing assembly test programs in simulation

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