

Arnav Verma | Dallas, TX

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## EDUCATION

University of North Texas — Denton, TX

**Bachelor of Science in Computer Science** - Expected May 2026 **GPA: 3.60**

**Relevant Coursework:** Data Structures & Algorithms (A+), Operating Systems (A+), Artificial Intelligence (A+), Software Engineering (A), Database Systems, Machine Learning (A), Natural Language Processing (A+).

**Affiliations:** IEEE Computer Society, UNT AI Research Program, UNT Robotics Club

**Achievements:** Dean's List, President's List, Winner at HackSMU 23 & 24, HackUNT 23 & 24, Runner Up HackUTD 24

## TECHNICAL SKILLS

**Languages:** Python, Rust, C++, SQL, TypeScript

**Libraries:** PyTorch, HuggingFace Transformers, FastAPI, Flask, React, Pandas, NumPy, Scikit-learn, TensorFlow

**Dev Tools:** AWS, Docker, Kubernetes, PostgreSQL, MongoDB, Jupyter, Azure, AWS, SageMaker

**Concepts:** LLM Fine Tuning, Machine Learning, Deep Learning, Adversarial ML, NLP, DevOps, CI/CD

## EXPERIENCE

University of North Texas - Denton, TX

*Undergraduate Research Fellow (May 2024 - Present)*

- **Fine tuned transformer models** (BERT, Longformer, LLaMA-2, LLaMA-3) for adversarial reasoning and retrieval augmented tasks, achieving **up to 28% faster convergence** by applying **4 bit quantization and LoRA parameter efficient training**
- **Built an evaluation framework** measuring reasoning degradation under adversarial perturbations, enabling **consistent model comparison across checkpoints and architectures**.
- **Engineered scalable fine tuning pipelines** using PyTorch, Hugging Face, and PEFT with automated preprocessing, worked with multiple data formats and reproducible metric logging (accuracy, F1, recall).
- **Collaborated with faculty researchers** to study adversarial backdoors in retrieval augmented generation systems, contributing empirical data to model safety evaluations presented at **UNT Research Day 2025**.

University of North Texas - Denton, TX

*Teaching Assistant – CSCE 4290: Natural Language Processing (Aug 2025 – Present)*

- Assisted professor in designing assignments, grading, and holding weekly office hours for 60+ students.
- Helped students understand concepts in **tokenization, embeddings, sequence models, and transformers**
- Built and maintained Jupyter-based lab templates demonstrating model fine-tuning using Hugging Face and PyTorch

## PROJECTS

**Llama-FineTune** | Python, PyTorch, Transformers, PEFT, BitsAndBytes | [github.com/namesarnav/llama-finetune](#)

- Built a **LoRA/QLoRA fine-tuning pipeline** for Llama models on NER and text classification tasks.
- Automated preprocessing (ConLL to Parquet) and evaluation using custom metrics (accuracy, F1, recall).
- Open sourced on GitHub integrated with Hugging Face Hub for reproducible results.

**Rubik's Cube Solver** | C++, Algorithm Design, Performance Optimization | [github.com/namesarnav/rubix](#)

- Designed a **state-space search engine** that computes optimal cube solutions using **Breadth-First Search (BFS)** and **A\*** with heuristic cost functions, achieving near-optimal move counts across random scrambles.
- Implemented an **efficient graph-based state representation** and memory-optimized hashing scheme, improving traversal speed by **40%** compared to naïve implementations.
- Benchmarked algorithmic performance across multiple solving strategies to evaluate trade-offs between time complexity and solution optimality.

**JWT Authentication & Key Management System** | Node.js, Express, SQLite, JWT, AES-256, RSA | [github.com/namesarnav/jwks](#)

- Engineered a **secure key management and authentication service** supporting automated **JWT generation, AES-256-encrypted key storage**, and **Argon2 password hashing**, ensuring end-to-end data confidentiality.
- Developed **RESTful API endpoints** with input validation, rate-limiting, and structured logging to handle concurrent authentication requests with high throughput.
- Automated **RSA key-pair rotation and expiry tracking**, mitigating cryptographic vulnerabilities while maintaining uptime.

## LEADERSHIP

**Eagle Ambassador** - Represented UNT in campus events and outreach initiatives; assisted prospective students in orientation sessions

**Career Readiness Peer Mentor** – Mentor students on resume building, interview preparation, and professional communication.