Dhruv Ajmera

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Education

University of Texas at Austin — Austin, TX
B.S. Computer Science • GPA: 4.0/4.0 — *Expected May 2029*

Courses: Real Analysis • Mathematical Statistics • Probability I • Linear Algebra • Differential Equations

Skills

Languages/Libraries: Python, SQL, C++, Java, R | Pandas, PyTorch, Scikit-learn | Git, Linux (systemd, btrfs), Bash
Mathematics: Measure-Theoretic Probability, Statistical Inference, Combinatorics, Real Analysis, Linear Algebra
Certifications: Akuna Capital Options 101

Research

An $\mathcal{O}(n)$ Construction of Superpermutations (CS + Math) — Mar 2024 – May 2025
Independent Researcher

- Designed a low-memory superpermutation algorithm in Java, reducing space complexity from $\mathcal{O}(n!)$ to $\mathcal{O}(n)$
- Implemented the algorithm, generating the $n = 14$ sequence with <1MB memory vs ∼187GB ($10^5\times$ reduction)
- Designed the construction as a single-pass streaming algorithm, making $\mathcal{O}(n)$ memory a structural property
- Presented at 20th TUMC; preprint available at arXiv:2505.09628 (CS.DM), endorsed by Dr. Scott Aaronson

Experience

Machine Learning R&D Intern — Jun 2026 – Aug 2026
Bespoke Technologies, Inc. — *Remote (Austin, TX)*

- Conducting literature reviews and prototyping/benchmarking ML models against satellite signals datasets
- Co-authoring white papers documenting experimental methodology, model performance, and results

Math Directed Reading Programs — Sep 2025 – Present
University of Texas at Austin — *Austin, TX*

- Selected for paid summer DRP in measure-theoretic probability, presenting project (financial application) in July
- Completed graduate-level statistical inference study (Casella-Berger), presented the Lehmann-Scheffé theorem
- Studied combinatorics (Stanley) and presented derivation of domino tilings of an $m \times n$ grid using graph theory

HRT Market Technologies — Jan 2026 – Apr 2026
Hudson River Trading, University of Texas at Austin — *Austin, TX*

- Selected for HRT-mentored program focused on quantitative trading, market microstructure, and exchange infra
- Studied modern CPU microarchitecture, kernel-bypass networking, and signal generation pipelines for market data
- Engaged directly with HRT engineers on real-world tradeoffs in latency, signal quality, and system design

Momentum X TPC Buildathon: Best Technical Execution — Nov 2025
University of Texas at Austin — *Austin, TX*

- Built health prediction app using neural networks (PyTorch) on NHANES dataset (50,000+ records, 50+ features)
- Conducted literature review and engineered features from raw healthcare data into a unified training dataframe

Projects

Trading Bot | *Python, Pandas, Scikit-learn, PyTorch, NumPy, Yfinance* — Nov 2025 – Present

- Built 12-bucket equity stratification pipeline (sector, realized volatility, liquidity) for regime-aware backtesting
- Prototyping quant strategies using SMA, EMA, RSI, and sentiment features over 500,000+ rows of market data

Poker Bot | *C++* — Dec 2025 – Present

- Implementing preflop decision logic in C++ using modified Chen formula over imperfect-information game states

Huffman Compressor | *Java* — Apr 2025

- Implemented a Huffman compression system in Java with encoding and decoding using frequency tree construction
- Utilized priority queue–based tree structures and bitstream encoding to achieve efficient compression