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Andres Abreu

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Education

Massachusetts Institute of Technology, Cambridge, Massachusetts — Expected Graduation: May 2027

Majors: Computer Science and General Mathematics (Course 6-3 and Course 18) — **GPA:** 4.7/5.0

Relevant Coursework: Algorithms, Probability, Statistics, Linear Algebra, Machine Learning, Deep Learning, Software Construction, Computation Structures, Computer Systems Engineering, Software Performance Engineering, Real Analysis

Experiences

Nominal — *New York, NY*

Software Engineering Intern — *June 2026 – September 2026*

- Building a custom curve-fitting feature, enabling engineers to fit, compare, and evaluate models against time-series data directly in Nominal.
- Worked on "Nominal for Motorsports" prototype to support motorsport telemetry analysis and race-engineering workflows.
- Building a benchmarking framework to measure performance, detect regressions, and guide optimizations.

Cherokee Nation — *Tulsa, OK*

Emerging Technologies Intern — *June 2025 – August 2025*

- Built an AI-powered legal search engine and assistant using FastAPI, React, and vector databases (BAAI/bge-large-en-v1.5 embeddings) to enable semantic search across Cherokee legal texts with automated source citation.
- Developed robust web scrapers and data pipelines to extract, OCR, and structure unstandardized legal documents into JSON for downstream ML applications.

MIT — *Cambridge, MA*

Undergraduate Researcher — *June 2024 – September 2024*

- Built data-driven and hybrid LSTM models in PyTorch to predict Area Control Error in power systems, combining physics-based forecasts with learned corrections.
- Evaluated forecast accuracy, data efficiency, and multi-step performance on real-world grid data; co-authored a paper comparing mechanistic, data-driven, and hybrid approaches.

Extracurriculars

MIT Motorsports — *Cambridge, MA*

Telemetry/Data Acquisition Lead — *August 2023 – May 2026*

- Lead design and implementation of the vehicle telemetry system, developing dual-core STM32 firmware for CAN data acquisition, SD logging, and WiFi/serial streaming to enable real-time telemetry.
- Built a Next.js + FastAPI telemetry platform with parallelized Plotly visualizations and InfluxDB/QuestDB edge-cloud replication, contributing to a 10/10 Formula SAE design score for LV/DAQ.

MIT Student Information Processing Board (SIPB) — *Cambridge, MA*

Keyholder, Project Lead: DormSoup — *August 2023 – May 2026*

- Led migration to self-hosted models and maintain an Express.js/Postgres backend with vector deduplication plus a searchable Next.js frontend serving 100 active users/month.
- Lead development of an LLM-powered web calendar, maintaining a multi-stage LLM (open-source) pipeline which detects, parses, and tags student event emails.

Projects

Introspective Bias Probes (IBPs) — *December 2025*

- Developed Introspective Bias Probes, attaching linear classifiers to multiple layers of CLIP-like vision and text transformers to audit and quantify internal demographic bias.
- Evaluated multi-layer probes across state-of-the-art VLMs, analyzing how demographic bias persists and migrates through internal representations.

Skills

Programming Languages: Python, C++, TypeScript

Frameworks & Tools: PyTorch, FastAPI, React, Next.js, Express.js, InfluxDB, QuestDB, PostgreSQL