

IMMANUEL ANABORNE

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Education

University of Pennsylvania

Expected December 2026

B.A. Computer Science and English | QuestBridge Match Scholar

Philadelphia, PA

Experience

Data Engineering Research Assistant

June 2025 – June 2026

Wharton Accounting Department

Philadelphia, PA

- Cut manual disclosure-classification effort 50% by building LLM classification pipeline (RAG, OpenAI API) that mapped unstructured corporate filings to trade codes, with event-driven ingestion layer to handle filing updates asynchronously
- Built async ingestion service (asyncio, BeautifulSoup) that pulled and parsed 60,000+ corporate filings, with Pydantic schema validation and pytest suites gating data integrity before load
- Deduplicated and normalized entities across 500+ firms with inconsistent naming using vectorized pandas/NumPy ETL workflows, eliminating manual entity-matching from the pipeline

Software Engineer Intern

May 2024 – August 2024

GoodRun

New York, NY

- Built and shipped in-house React feedback tool that replaced paid third-party vendor, eliminating recurring license cost and giving team direct ownership of data pipeline
- Reduced production deployment failures 15% by hardening CI/CD pipelines with GitHub Actions and rollback rules
- Owned triage and resolution of 20+ production defects across feedback and CI tooling codebase on weekly release cycle

Projects

Kalshi NFL/NBA Prop Pricing Study | *Python, pre-registered study*

2026

github.com/anaborne/kalshi-prop-calibration

- Pre-registered a study of Kalshi NFL/NBA prop pricing before pulling any data and published the null: the forecast lost to the exchange mid-quote at -0.0219 Brier skill on the 82.7% of the 87,053-observation training partition quoted two-sided
- Showed the standard mid-quote convention stops being a probability when one side of the book is absent, on 17.3% of the same training partition, and that those rows alone invert the sign of the pooled skill score
- Walked 65,226 settled markets and 1.88M hourly candles unauthenticated; free public data reproduced the exchange's own settlement on 61,978 of 61,984 markets (99.990%), with all six disagreements named

Executor Hot Path in C++ | *C++20, CMake, Catch2, OpenSSL, SQLite*

2026

github.com/anaborne/executor-hotpath-cpp

- Rewrote the trading system's executor process in C++20 against the same wire protocol; the unmodified Python poller drove it across 4,400 frames with every frame accepted and zero telemetry rows dropped
- Timed both executors in one run on one machine: executor-side wake-recv fell 2.4x at p99 and 2.8x at p50 (4.5us to 1.6us at p50), published as an upper bound with the process-topology confound disclosed

Kalshi / Polymarket Trading Infrastructure | *Python, asyncio, uvloop, SQLite, Prefect*

2026

github.com/anaborne/prediction-market-infra

- Architected two-process trading system (poller + pre-warmed executor over Unix domain socket); adopted uvloop over stock asyncio on benchmark evidence, and published the benchmark harness so the comparison runs from a clean clone
- Designed IDF-weighted inverted index that prices a full two-venue cross in 113 seconds by cutting $\sim 1\text{B}$ -pair search space to $\sim 63\text{K}$ scored candidates
- Root-caused position-cap defect that rejected 4,233 valid orders over 23 hours against zero open positions; replaced counter-based estimate with live exchange-position reconciliation at no added API cost

Technical Skills

- **Languages:** Python, C++, TypeScript, JavaScript, SQL
- **Frameworks & Libraries:** Node.js, REST APIs, asyncio, Pydantic, React, MCP servers, agentic tooling
- **AI & Data:** LLM integration, RAG pipelines, OpenAI API, MCP SDK, pandas, NumPy
- **Infrastructure:** Docker, GitHub Actions, Git, pytest, CMake, Catch2

Additional

U.S. National Team Training Partner, Short Track Speed Skating | *US Speedskating*

2019 – 2022

- U.S. Junior Development Team, 2019 and 2020; 16th and 15th overall at the 2019 and 2020 U.S. Championships