

Elchin Hasanov

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EDUCATION

Georgia Institute of Technology

Bachelor of Science in Computer Science

Atlanta, GA

Graduation date: May 2027

- **GPA:** 4.0 / 4.0

- **Related Coursework:** Linear Algebra, OOP (Java), Data Structures & Algorithms, Computer Organization

EXPERIENCE & RESEARCH

Baku Stock Exchange

Feb 2024 – Mar 2025

Software Engineering Intern

Remote

- Modified real-time trading analytics in **Django** and **PostgreSQL**, streaming multi-GB order-book feeds via **Redis**, reducing query latency using **NumPy/Pandas** from **25s** to **4.7s**.
- Developed **React.js** dashboards with **WebSocket** channels and REST APIs for visualization of liquidity, VPIN, and volatility metrics accessed by **15+** analysts daily.
- Orchestrated **Dockerized** microservices on **AWS EC2** with GitHub Actions CI/CD, integrating automated **latency-anomaly detection** to scale from **5k** to **30k** daily requests without regressions.

Agrar Insurance Fund

May 2025 – August 2025

Software Engineering Intern

Baku, Azerbaijan

- Designed an ETL pipeline combining climate APIs and satellite imagery in **PostgreSQL**, using **scikit-learn** preprocessing and PCA-based reduction to process **100K+** data points.
- Optimized climate-feature computation by writing a **C++** module with OpenMP, speeding up NDVI and drought-index calculations by **38%** for downstream pipelines.
- Configured a multi-model ensemble (**XGBoost DART**, **Stacked Logistic Regression**) for drought and claim-risk scoring on **AWS Batch** and **Docker**, automating **1,200+** claim reviews and cutting analysis time from **4h** to **30m**.

AI for Social Impact Lab

May 2025 – Present

Undergraduate Researcher — Georgia Institute of Technology

Atlanta, GA

- Prototyped a structured **Mamba + Transformer** model for implied volatility forecasting, combining PCA, CNN encoders, and **Pandas** preprocessing with a differentiable SVI decoder for **arbitrage-free** outputs.
- Implemented selective state-space layers, gated mixing, and residual attention in **PyTorch**, leveraging CUDA kernels, **PyTorch Lightning** training loops, and DeepSpeed optimizations for long-range SPX option dynamics.
- Evaluated LSTM, Transformer, and Mamba baselines using surface-MSE and arbitrage metrics on **Kubernetes**, leveraging custom **C++** kernels for fast evaluation and achieving **22%** lower error and **31%** fewer violations.

Breakthrough Research Trend Forecasting

Jul 2025 – Present

Research Assistant — Georgia Institute of Technology

Atlanta, GA

- Built a **Playwright + asyncio** ingestion pipeline scraping **20K+** papers into a structured **MySQL** dataset and generating **SentenceTransformers** embeddings to enable semantic comparison across papers.
- Applied **UMAP + HDBSCAN** (BERTopic) and integrated Semantic Scholar/OpenAlex **APIs** with FAISS to group related research and compute growth/momentum signals for spotting fast-emerging topics.
- Embedded **Power BI** reports into a **Next.js** frontend to surface papers and topics with the highest early-impact potential.

PROJECTS

ExamZen — Educational AI Platform

| 1,500+ users, 7 IB schools, raised \$20K

- Built a platform for IB students, offering tailored study tools, auto-graded practice exams, and adaptive question banks.
- Architected **Django REST** with **PostgreSQL + Redis** backends, Dockerized and deployed on **AWS EC2/S3**, scaling to **50K+** questions/day with under 2s latency.
- Implemented a **React.js** frontend with **Tailwind** and **Firebase Auth**; refined model-based question generation and grading workflows, improving scores by **30%** and reducing review time by **60%**.

PathFindr — Multimodal Visual Navigation Assistant

| AI ATL Hackathon Winner

- Built an iOS (**Swift**) assistant using **ARKit + LiDAR** to construct a live 3D map, detect obstacles within **0.3–10.2m**, and provide directional haptic + spatial audio cues.
- Developed a **Flask** middleware and Gemini ADK multi-agent backend to fuse depth, vision, and semantic context, achieving under **300ms** guidance latency and **92%** hazard detection precision.
- Implemented hands-free voice interaction with Apple Speech + TTS and **Firebase**-backed conversation memory supporting context-aware follow-up queries.

SKILLS

Tech Stack: Python, C++, Django, React.js, Swift, React Native, PyTorch, Pandas, MySQL, PostgreSQL, AWS, Git, Docker

Languages: English, Russian, Turkish, Azerbaijani