

# Aesha Shah

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## EDUCATION

### Georgia Institute of Technology (Georgia Tech)

Atlanta, GA

*B.S. in Computer Science (Cybersecurity & AI), Minors in FinTech and Law, Science, & Technology*

*Expected: May 2027*

Relevant Coursework: Information Security, Systems & Networks, Computer Architecture & Programming, Human Dimension of Cybersecurity, Objects & Design (SWE Principles), Data Structures & Algorithms, Finance & Investments

Activities and Honors: Scholarship Recipient & Fellow—**AmazonNEXT**, Executive Team—**AI @ Georgia Tech**, Lead Campus

Representative—**National Center for Women & Information Technology**, Member—**GreyHat Cybersecurity**

Certifications: AWS Machine Learning Engineer Associate, AWS Solutions Architect Associate, AWS Cloud Practitioner, AWS AI Practitioner

Bootcamps / Programs: Intermediate Cybersecurity—CodePath CYB102, Advanced Technical Interview Prep—CodePath TIP103

## EXPERIENCE

### Lead Undergraduate Researcher (NLP & FinTech)

January 2025 – Present

*Natural Language Processing for Financial Markets, FinTech Lab / Georgia Tech VIP Team*

*Atlanta, GA*

- Developed a natural-language (NL)-to-SQL pipeline using **compositional/multi-stage SQL generation**, **schema serialization**, **schema canonicalization**, and **schema-aware prompting** to reliably translate financial queries into grounded SQL across **heterogeneous IMF financial statistics datasets**; incorporated **retrieval-augmented generation (RAG)** principles to reduce hallucinations and improve execution. (August 2025 – Present)
- Built a scalable LLM evaluation harness featuring **110 complexity-controlled query templates** covering **multi-hop reasoning**, **temporal comparisons**, **nested SQL**, and **cross-country/indicator** analytics; integrated **data-to-text verbalization** and structured reliability metrics to **benchmark LLM reasoning** quality in natural-language financial analytics applications. (August 2025 – Present)
- Contributed to the construction of **FinLitQA**, a **4,300-example benchmark** of **long-context** financial reasoning questions sourced from real credit-card agreements, enabling **LLM performance evaluation** on **compounding**, **payment rules**, and **consumer-oriented financial reasoning** under **Chain-of-Thought** and **Program-of-Thought** prompting. (January – May 2025)

### Solutions Architect Intern (GenAI & Application Security)

May – August 2025

*Amazon Web Services (AWS)*

*Seattle, WA*

- Developed a **secure full-stack specifications intelligence application** with **Python**, **React**, **Flask**, **Lambda** functions, **S3**, **EC2**, and **REST APIs**, integrating **Amazon Textract** and **Bedrock** to extract and structure content and entities from unstructured, high-volume PDFs—reducing **manual review by 70%** for **high-risk workflows** in defense, real estate, and infrastructure sectors.
- Integrated robust end-to-end **security architecture**, including **fine-grained IAM policies**, **document scoping guardrails**, and **distributed data protection**, combined with Bedrock LLM controls based on **OWASP Top 10 risks** using **I/O validation**, **scoped prompts**, and **content-safety filters**—removing **prompt-injection** paths and mitigating hallucinations.
- Internal Hackathon (CSC-Tech Jam) Project: Created frameworks for **enterprise-grade encryption** and audit controls using **AWS Key Management Service** and **S3**, securing AI-generated content for customer financial interactions; ensured **regulatory compliance** through **encrypted data-at-rest**, **security event tracking**, and integration with **financial-grade monitoring protocols**.

### Software Engineering Intern (GenAI & Multi-Agent AI)

June – August 2024

*United Parcel Service (UPS)*

*Atlanta, GA*

- Engineered GenAI-based system, utilizing **Google Cloud Platform - VertexAI's text-bison** model for classification, to **accurately curate template responses** and **detect potential fraud** for small-package billing inquiries regarding disputes, invoices, and accounts, reducing manual handling time by **30%**.
- Restructured service messaging response application using **LangGraph** multi-agent framework (based on comparative analysis with **CrewAI**, **AutoGen**, and **Semantic Kernel**) and **Azure GPT4o** to handle an average **50K daily cases globally**, across **100 customer service and non-service categories**, and projected to reduce operating costs by **\$1.5M**.

## TECHNICAL PROJECTS

### Malware Analysis Sandbox | *Python, TensorFlow, VirtualBox, Cuckoo Sandbox, Procmon, Wireshark, Ghidra, YARA*

- [In progress] Building a virtual lab using **Cuckoo Sandbox**, and open-source tools **Process Monitor (Procmon)**, **Wireshark**, **Ghidra**, and **YARA** to perform dynamic malware analysis, while experimenting with **Machine Learning (TensorFlow)** models to classify malware behavior, extract Indicators of Compromise (IOCs), and map to **MITRE ATT&CK** framework.

### CS 3235 Information Security Course Projects | *Python, GDB, Docker, Wireshark, Autopsy, OpenSSL, ROPgadget, Linux utilities, UTM*

- Completed security labs covering application exploitation (**buffer overflows**, **shellcode**, **ROP**), cryptographic attack implementation (**length-extension**, **MD5/SHA length extension & collision crafting**, **padding-oracle decryption**, **RSA signature forgery**), web security exploitation (**SQL injection**, **multi-stage XSS payloads**, **CSRF automation**), **network traffic analysis with Wireshark**, and **digital forensics using Autopsy**—developing hands-on offensive security skills across systems, cryptography, web stacks, and networking using **Docker**, **GDB**, and **controlled VM environments**.

### WanderSync | *Java, Android Studio (Java), Firebase*

- Implemented key features (using **Java**) for a collaborative travel management mobile app in **Android Studio**, including **secure authentication** and **access controls with Firebase**, real-time collaboration tools, and integration of **multiple databases** (destinations, dining, accommodations) while maintaining **MVVM architecture** standards.

### BrailleBuzz | *Python, TensorFlow, Android Studio (Kotlin)*

*Hack for Impact 2023, 1st place Advanced Track*

- Developed **Convolutional Neural Network (CNN)** model for translating Braille images to English text outputs; utilized **Android Studio** to adjacently develop a mobile application for simulating basic translation functionality.

### Overfishing Detection | *Python, TensorFlow, scikit-learn, NumPy, pandas*

*ISEF 2021, 2nd place Environmental Engineering*

- Developed CNN model to detect fishing activity from Satellite-AIS data, processing **500K+ records with pandas and NumPy**, and achieved **94% accuracy using ReLU, Adam, and GroupKFold**, with results visualized over regulation zones using **Matplotlib**.

## TECHNICAL SKILLS

**Languages:** Python, Java, C/C++, SQL, JavaScript, TypeScript, HTML/CSS, Swift, R, ARM / MIPS / x86\_64 Assembly, Bash

**Frameworks / Libraries:** React, Flask, TensorFlow, Hugging Face (Transformers + GraphCodeBERT), LangChain/Graph

**Tools / Services:** Git/GitHub, Android Studio, Firebase, GCP Vertex AI, Microsoft Azure, AWS cloud services, Terraform, GNU Debugger

**Security / OS:** OpenSSL, Metasploit, Wireshark, Autopsy, Nmap, Ghidra, YARA, Procmon, OWASP and MITRE ATT&CK frameworks