Zaynab Tariq

Education

Colby College, Waterville, ME **Bachelor of Arts, May 2026**

Majors:** Computer Science: AI* ***GPA: 4.0/4.0

- **Relevant Coursework**: Data Structures & Algorithms, Data Analysis & Visualization, Linear Algebra, Analysis Of Algorithms, Databases, Software Engineering, Neural Networks, Computer Vision, Reasoning & Agents (University of Edinburgh)

Technical Skills

Languages: Python, JavaScript, Java, C++, C, SQL, HTML5, Swift, Stata, Typescript **Frameworks:** React, Next.js, Node.js/Express, Flask, FastAPI, TensorFlow, scikit-learn **Tools:** Git, Docker, Kubernetes, GCP, Harness CI/CD, RESTful APIs
Databases: PostgreSQL, MySQL, MongoDB, Neo4j **Other:** Linux, Tableau, OAuth2/JWT, Agile, vector search, evaluation harnesses

Experience

L.L.Bean **Jun. 2025 – Aug. 2025**

Software Engineering Intern *Freeport, ME*

- Developed and deployed a Node.js microservice on GCP (GKE) using Workload Identity and Secret Manager for secure service auth, powering real-time PayPal transaction retrieval for internal finance tools.
- Built a full-stack inquiry tool using React, Express, and JWT-based SSO, replacing legacy systems and improving data visibility for Treasury operations.
- Implemented and maintained CI/CD pipelines with Harness, containerized services with Docker, and configured Kubernetes health checks to ensure production reliability.

Davis Institute of Artificial Intelligence, Colby College **Jan. 2024 – Dec. 2024**

Research Assistant *Waterville, ME*

- Architected a large-scale multi-agent memory system using FAISS vector database and PostgreSQL to store and retrieve 100,000+ conversation embeddings, enabling long-term contextual retrieval and reducing overhead by 40% while maintaining 95% consistency in agent responses.
- Built an LLM-based Retrieval-Augmented Generation (RAG) stack (GPT-4, Claude, LLaMA) with embedding search and prompt templates; experimented with retrieval parameters and prompt variants to balance answer quality and latency, enabling 3× faster deployment of contextual conversations across 200+ simulations.
- Published a first-author paper on Comp-HuSim at **ACM UMAP 2024**, presenting a novel framework for persistent digital personality simulation and long-term conversational memory.

Davis Science Center, Colby College **Feb. 2023 – Jun. 2024**

Research Assistant *Waterville, ME*

- Led research study analyzing GitHub Copilot's impact on coding efficiency, developing Python GUI tools that reduced data processing time by 40% and saved 200+ research hours analyzing eye movements of 420 participants.
- Designed and executed multi-task experiments comparing Copilot vs web-based coding, utilizing eye-tracking metrics, completion rates, and user feedback to quantify improvements in code comprehension and debugging efficiency.
- Evaluated 200 code samples from beginner programmers, demonstrating Copilot users produced 55% more code with 25% fewer style errors, leading to 40% faster onboarding for new developers.

Speeqr **Jun. 2023 – Aug. 2023**

Software Engineering Intern *Lahore, Pakistan*

- Developed AI-driven packet loss concealment system using TensorFlow and Python, reducing audio degradation by 35% in VoIP calls and decreasing customer support tickets by 25%.
- Built real-time network simulation tools in C++ and Qt to analyze and mitigate audio transmission issues (packet loss, delay, jitter) improving call quality by 20%.
- Automated testing pipeline for audio processing algorithms, achieving 95% test coverage and reducing deployment errors by 30%.

Projects

Colby Dining App | *Lead Developer* **Fall 2024**

- Engineered a full-stack dining analytics platform using Flask/SQLAlchemy backend and React frontend, featuring real-time menu updates and wait time estimates for 2000+ potential users with comprehensive unit and integration testing, achieving 98% test coverage and reducing bugs in production by 70% while serving real-time predictions to 500+ users.
- Trained and deployed an LSTM model to predict dining hall occupancy with 85% accuracy, exposing predictions via REST APIs to help dining services optimize staffing and reduce food waste by 25%.
- Developed automated data pipeline using JawsDB and React components, cutting manual data entry work by 75% while delivering real-time wait time predictions through RESTful API endpoints.

Allen Island Digital Twin Project | *Database Developer* **Spring 2024**

- Architected MongoDB database system to process high-bandwidth sensor data (weather, wave, audio) from multiple collection points across Allen Island.
- Optimized data ingestion pipeline with strategic indexing, reducing query response time for real-time VR simulation updates.
- Designed cross-platform integration framework connecting sensor networks to OpenTwins platform, enabling collaboration between 3 research departments and improving research accessibility by 50%.

Extracurricular Activities

HackMIT 2024: Built a React-based AI skincare recommender with YOLO backend and fetch.ai agents in 24 hours, focusing on rapid iteration and demoability.

Clubs & Organizations: Colby Robotics, Colby Investment Association, Colby Hackers, Women in CS, Women in Finance, Colby Mountaineering Club, Girls Who Code, Rewriting The Code