

AYESHA SHAFIQUE

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EDUCATION

University of Wisconsin–Madison

M.S. in Computer Science, GPA: 4.0/4.0

Madison, WI

Sep 2025 – Jan 2028

Lahore University of Management Sciences (LUMS)

B.S. in Computer Science, GPA: 4.0/4.0, Summa cum laude, Dean's Honor List

Lahore, Pakistan

Aug 2021 – May 2025

EXPERIENCE

Trusted CI, NSF Cybersecurity Center of Excellence

Madison, WI

Graduate Research Assistant, Prof. Barton P. Miller | LLM Agents, C, Go, Linux

May 2026 – Present

- Designed a **multi-agent development methodology** and authored 15 agent skills to measure the strengths and limits of LLM coding agents and systematically categorize their failure modes when implementing complex systems software.
- Used the methodology to drive AI-assisted development of 12 Linux utilities in C including **make**, **grep**, **dash**, and **nano** from documentation alone, passing **98%** of upstream tests with **46% fewer lines**.
- Evaluated AI-generated utilities against their human-written counterparts for correctness and memory-safety defects across **4,280 black-box tests** and AFL++ fuzzing campaigns; accepted at the **NSF Cybersecurity Summit 2026**.
- Rebuilt the Miller et al. fuzzer in Go with goroutine worker pools and self-healing campaigns, raising throughput **8×**.

Meta Production Engineering Fellowship (Major League Hacking), 1 of 100

Remote

Production Engineering Fellow | Linux, Docker, NGINX, Prometheus, Grafana, CI/CD

Jun 2026 – Present

- Deployed and managed **Linux infrastructure** on CentOS, running a containerized **Flask/MySQL** service behind **NGINX** and a Cloudflare CDN with TLS termination, request routing, rate limiting, and Bash host provisioning.
- Automated **CI/CD** with Bash and GitHub Actions, gating every deploy on tests, security scans, and health checks, then monitored CPU, memory, and I/O with **Prometheus**, **cAdvisor**, and **Grafana** to cut detection time **80%**.

University of Wisconsin–Madison, CS 220: Data Science Programming

Madison, WI

Head Teaching Assistant & Engineering Lead | Python, FastAPI, Azure, Redis, OpenTelemetry

Jan 2026 – May 2026

- Automated one-on-one help for a **900+** student course with an AI tutoring platform on FastAPI and autoscaling Azure VMs, MySQL, Redis, campus SSO, and Traefik, provisioning, scaling, and operating the production infrastructure alone.
- Rebuilt the Python autograder with a linear-time algorithm and automated score uploads, **12×** faster on 12K+ submissions.
- Cut LLM inference cost **80%** with per-identity API rate limiting and Redis caching of model responses to repeated queries.
- Halved incident response time with **OpenTelemetry** tracing and Prometheus/Grafana alerting on outages and degradation.
- Led a **12-person engineering team** shipping 13 course projects, owning code review, on-call rotation, and CI/CD.

Awaaz-e-Sehat, Gates Foundation & Google Academic Research Award

Lahore, Pakistan

Software Engineering Intern | React Native, Bun/Hono, Python, Kafka, Cloud Run, Pulumi

May 2024 – May 2025

- Automated paper charting in an understaffed maternity hospital, shipping a full-stack React Native mobile app that ran in production for **7 months**, working alongside doctors, product managers, and AI researchers.
- Architected the backend as Bun/Hono and FastAPI microservices on Cloud Run with pgBouncer-pooled PostgreSQL, defined as code with Pulumi and shipped through automated GitHub Actions builds.
- Engineered the pipeline turning code-switched Urdu and Punjabi dictation into structured records, pairing LoRA fine-tuned Whisper (**46% to 13%** word error rate) with LLM structured extraction at **96%** field accuracy.
- Shipped the alerting service matching symptoms to clinical guidelines, raising complication detection from **7% to 40%**.

PROJECTS & OPEN SOURCE

Textish | Python, asyncio, AsyncSSH, Load Testing, PyPI

- Created and maintain an open-source SSH application server serving Textual terminal apps to remote users; replaced process-per-session execution with an asyncio event loop for **96×** less memory and **1,000 concurrent sessions**.

Google Gemini CLI | TypeScript, React Ink, Open-Source Developer Tools

- Added prompt-history reverse search, refactoring the hook into a provider with debounced incremental lookups and multi-line rendering for long prompts; **2 PRs merged** after maintainer review ([#5539](#), [#4793](#)).

Human-Centered LLMs for Health | LLMs, RAG, AWS EC2, DynamoDB, ACM CHI 2026

- Co-designed a RAG health assistant with **30** non-technical participants and evaluated **600+** real-world interactions, translating privacy, stigma, and misinformation findings into responsible-AI guardrails; published at [ACM CHI 2026](#).

Open-Source Systems Contributions | Rust coreutils, GNU utilities, GDB, AddressSanitizer

- Redesigned **ptx** in Rust coreutils around a linear-time algorithm storing file indices instead of cloning per word, running **29×** faster with 30% lower peak memory; merged upstream after maintainer review ([#14021](#)).
- Root-caused **5+** memory-safety defects in GNU **less**, **ptx**, and **dash** from stack traces and AddressSanitizer reports, landing upstream fixes for a use-after-free, an invalid free, and a ptx infinite loop in utilities shipped on millions of Linux systems.

TECHNICAL SKILLS

Languages: Go, TypeScript, JavaScript, Python, C++, C, Rust, SQL, Bash

AI & Developer Tools: Claude Code, AI Coding Agents, Multi-Agent Workflows, LLM Evaluation, RAG

Full Stack: React Native, Bun/Hono, FastAPI, Flask, REST APIs, PostgreSQL, MySQL, Redis

Infrastructure: Linux, Docker, Kubernetes, GCP, AWS, Azure, Pulumi, NGINX, CI/CD, Prometheus, OpenTelemetry

Core: Distributed Systems, Concurrency, Data Structures & Algorithms, Debugging, Testing, Automation