Anna Mazhar

anna-mazhar.github.io | annam@cs.cornell.edu | anna-mazhar | anna-mazhar

Education

Cornell University *Ph.D., Computer Science* Aug. 2024 – Present
Coursework: Certified Software Systems

University of Illinois Urbana-Champaign *MS, Computer Science* Aug. 2022 – May 2024
Coursework: Cloud Storage Systems, Adv. Distributed Systems, Adv. OS, Adv. SE ***CGPA**: 4.0/4.0*

Technical Skills

Languages/SDKs: C/C++, Python, JavaScript, Typescript, Go, Coq, SQL, HTML, CSS, Boto3, Azure SDK, DotNet
Libraries: ReactJS, Node, Express.js, MongoDB, gRPC, NumPy, pandas, Puppeteer, jQuery, Material-UI, Scikit-learn, PyTorch
Developer Tools: Azure, AWS, GitHub Actions, Docker, LocalStack, Azurite, Chrome DevTools, Lighthouse, Istanbul, Figma

Experience

xlab, UIUC Sep. 2022 – Aug. 2024
Lead Research Assistant *USA*

- Evaluated the reliability and accuracy of cloud service emulators, including Azurite and LocalStack, in software testing environments. Built an SDK fuzzer that identified discrepancies in 94 out of 255 APIs across five cloud services from Azure and AWS, highlighting inconsistent behavior between emulated and real services.
- Performed root causes analysis of all APIs with discrepant HTTP responses, server states, and error messages. Reported 12 bugs in emulators, having all confirmed, and 6 fixed.
- Built a hybrid testing tool for enhanced reliability and savings in emulator-based CI/CD environments which achieved up to 100% savings when evaluated against popular open-source projects.

Networks and Systems Group, LUMS June 2020 – May 2022
Research Assistant *Pakistan*

- Evaluated strategies to enhance mobile web performance and accessibility on low-end devices, including device-aware web optimizations.
- Developed an affordable web framework, enabling low-complexity versions of webpages which achieved a 1.4x reduction in website complexity for 50% of 1,000 popular webpages and optimized over 60% of images in 70% of webpages, without compromising quality.

Dlab, EPFL June 2021 – Dec. 2021
Research Intern *Switzerland*

- Developed a Vocabulary Learning tool focusing on teaching through passive exposure, embedding translated words in users' daily information intake.
- Built a React Web Application for a user study, dynamically embedding translated words in e-books to analyze user interactions and reading habits.

Publications

Fidelity of Cloud Emulators: The Imitation Game of Testing Cloud-based Software *(ICSE 2025)*

Anna Mazhar, Saad Sher Alam, Xinze Zheng, Yinfang Chen, Suman Nath, Tianyin Xu

Selected Projects

Testing for Machine Unlearning | *Pandas, NumPy, scikit-learn, SHAP* Sep. 2024 - Present

- Developing a comprehensive test suite to assess feature unlearning in AI models, ensuring no residual influence from unlearned features by analyzing both direct and indirect contributions to model outputs.
- Evaluating existing influence metrics and identifying limitations in their accuracy.

Verifying AVL in Coq | *Coq* Oct. 2024 - Present

- Implementing and formally verifying AVL tree data structure operations using Coq proof assistant.

Multi-Writer Muti-Reader Shared Registers | *Go, gRPC, Protobuf* April. 2023 - May 2023

- Implemented MWMR Shared Registers protocol in Go, using gRPC and Protobuf for client-server communication.
- Developed quorum-based operations for fault tolerance and data consistency.
- Ensured linearizability through ABD protocol implementation.

Raft | *Go* Oct. 2021 – Nov. 2021

- Implemented a fault-tolerant key-value storage service using Raft consensus algorithm.
- Ensured consistent log replication and leader elections in cases of network partitions and server crashes.

QuestSpace | *ReactJS, MongoDB, ExpressJS, Node.js, AWS* Feb. 2021 – April 2021

- Developed a responsive web application using the MERN stack.
- Enabled users to host and participate competitions; competitions featured quizzes, rapid-fire, and submission rounds.

Resilient P2P File Sharing | *Python* April 2020 – May 2020

- Built a key-value storage system that leverages Consistent Hashing using Python Socket Programming.
- Ensured resilience to node failures.

Selected Awards

Erasmus Mundus Scholarship (∼ €49000)
Awarded to 26 Outstanding applicants for Master's program out of 735 applicants (Declined)

LUMS Merit Scholarship Award (∼5000 USD)
Awarded to Top 15 students of the batch

Selected for Summer@EPFL program
Selected out of 4500 students with an acceptance rate of 1-2%

Dean's Honor List (LUMS)
Awarded for Outstanding Academic performance at the end of the academic year (Won three times consecutively)