Anna Mazhar

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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, Fault Tolerant Systems ***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*

- Inspected the fidelity of cloud service emulators, including Azurite and LocalStack, in the context of software testing.
- 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 upto 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 machine learning 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, and providing detailed insights on unlearning effectiveness.

Verifying Cloud Block Storage in Coq | *Coq* Oct. 2024 - Present

- Developing a Coq-based verification framework for cloud storage system, to model, and reason about storage operations.
- Using separation logic to model and verify cloud block storage properties.

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)