

Muhammad Salman Abid

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Education

Cornell University

PHD IN COMPUTER SCIENCE

- Advised by Professor Hakim Weatherspoon

Ithaca, NY

Aug. 2024 - Aug. 2029 (Estimated)

Habib University

BS IN COMPUTER SCIENCE

- Minor in Electrical & Computer Engineering
- Undergraduate Capstone in CV & Image Synthesis

Karachi, Pakistan

Aug. 2018 - Jun. 2022

Research

Graduate Researcher – Weatherspoon Lab

SUPERVISED BY HAKIM WEATHERSPOON (CORNELL)

- Building Private Computation Spaces (PCS), a distributed computing framework with **KubeStellar** (IBM, CNCF) and **Confidential Containers** (CNCF) for confidential computing workloads; particularly agri-tech and digital agriculture
 - ◊ Managing **multi-cluster orchestration** for Kubernetes clusters deployed on farms
 - ◊ Developing confidential **Federated Analytics** to preserve privacy while querying trends over distributed agricultural data.
- Closing the loop with reporter plants: a software-hardware interface for automating irrigation in the greenhouse. An inter-disciplinary collaboration with Cornell's Center for Research on Programmable Plant Systems (CROPPS)

Ithaca, NY

Sep. 2024 – Present

Research Intern – Intelligent Code Analysis Testing (CAT) Lab

SUPERVISED BY REYHANEH JABBARVAND (UIUC) AND DARKO MARINOV (UIUC)

- Worked with PhD student Ali Ibrahimzada on their project for automating **code translation using LLMs**
- Contributed to testing LLM-translated code using compositional testing with GraalVM

Illinois, USA (Remote)

Feb. 2024 – Jul. 2024

UIUC+ Summer Undergraduate Research in Software Engineering

SUPERVISED BY DARKO MARINOV (UIUC) & SAIKAT DUTTA (CORNELL)

- Built interop bindings between **Java** and **Python** using **GraalVM** to embed Python into existing Java programs. Translated and embedded Apache's Commons CLI and Commons CSV using GraalPy
- Translated part of Cornell's DeathStarBench microservice suite from **Go** into both **JavaScript** and **Rust**, while ensuring plug-n-play compatibility with the original cluster

Illinois, USA (Remote)

May 2023 – Jan. 2024

Work Experience

CreditBook

SENIOR FULL STACK ENGINEER

- Bootstrapped CreditBook's core banking system, catering to 100s of lending operations daily
- Owned production environments on AWS EKS for financial transaction services, including GitHub CI/CD for automated deployments

Karachi, Pakistan (Hybrid)

Feb. 2024 - Aug. 2024

FULL STACK ENGINEER

- Built async payment integrations with leading financial institutions in Pakistan
- Designed a pipeline for automated KYC document verification for micro-financing using CV and ML workloads
- Deployed a centralized logging environment (Slack, CloudWatch, S3) to notify internal channels on critical failures.

Jun. 2022 - Feb 2024

Open-Source Contributions

- 2026 **Feature contribution**, Nanvix: microkernel-based research operating system from Microsoft Research. [PR]
- 2025 **AWS YAML maintenance**, Confidential Containers: Cloud API Adaptor. A CNCF Project. [PR]
- 2024 **Feature contribution**, NYU Open Source Software: Gradescope API [PR]
- 2023 **Language runtime bug report**, Oracle's GraalPython [Issue] [PR]
- 2023 **Compiler bug fix**, Winglang Programming Language [PR]
- 2023 **Flaky test fix**, SOFABoot Framework (based on Spring Boot) [PR]

Skills

Platform	Azure, AWS, Docker, Kubernetes, KubeStellar, Confidential Containers, GitHub Actions (CI/CD)
Back-end	NestJS, Express, Fastify, Flask
Front-end	React, Redux, React Native (Android), Next.js
Programming	JavaScript, Python, C/C++, Java, Rust, OpenMP/MPI

Publications

CONFERENCE PROCEEDINGS

- 2025 **AlphaTrans: A Neuro-Symbolic Compositional Approach for Repository-Level Code Translation and Validation,** [Paper]
Ali Reza Ibrahimzada, Kaiyao Ke, Mrigank Pawagi, **Muhammad Salman Abid**, Rangeet Pan, Saurabh Sinha, and Reyhaneh Jabbarvand. In: *ACM Foundations of Software Engineering (FSE) 2025*
- 2024 **GlueTest: Testing Code Translation via Language Interoperability,** [Paper]
Muhammad Salman Abid, Mrigank Pawagi, Sugam Adhikari, Xuyan Cheng, Ryed Badr, Md Wahiduzzaman, Vedant Rathi, Ronghui Qi, Choiyin Li, Lu Liu, Rohit Sai Naidu, Licheng Lin, Que Liu, Asif Zubayer Palak, Mehzabin Haque, Xinyu Chen, Darko Marinov and Saikat Dutta. In: *IEEE International Conference on Software Maintenance and Evolution (ICSME) 2024 NIER*
- 2023 **Fabric Sketch Augmentation & Styling via Deep Learning & Image Synthesis,** [Paper]
Omema Ahmed, **Muhammad Salman Abid**, Aiman Junaid, Syeda Saleha Raza. In: *EvoMUSART 2023. Lecture Notes in Computer Science, Springer, Cham.*
- 2022 **Automation of Fabric Pattern Construction using Genetic Algorithms,** [Paper]
Omema Ahmed, **Muhammad Salman Abid**, Aiman Junaid, Syeda Saleha Raza. In: *ISMSI 2022*

POSTER PRESENTATIONS

- 2025 **Private Computation Spaces via Confidential Containers and KubeStellar,** [Poster]
Muhammad Salman Abid*, Shuangyu Lei*, Hakim Weatherspoon.
At: *KubeCon + CloudNativeCon North America 2025*

Honors & Awards

- 2025 **Award**, Outstanding TA for CS 3410 (Fall 2024), *Cornell University* Ithaca, NY
- 2022 **Award**, Best Capstone for Computer Science (2021 - 2022), *Habib University* Karachi, Pakistan
- 2018 **Award**, 50% Merit Scholarship for Academic Excellence, *Habib University* Karachi, Pakistan

Teaching Experience

- FA 2025 **Graduate Teaching Assistant**, CS 6410: Advanced Systems *Cornell University*
- SP 2025 **Graduate Teaching Assistant**, CS 3410: Computer System Organization and Programming *Cornell University*
- FA 2024 **Graduate Teaching Assistant**, CS 3410: Computer System Organization and Programming *Cornell University*
- FA 2021 **Teaching Assistant**, CS 232(L): Operating Systems *Habib University*
- SP 2021 **Teaching Assistant**, EE/CS 371/330: Computer Architecture *Habib University*
- SP 2020 **Teaching Assistant**, CS 101(L): Programming Fundamentals *Habib University*

Student Leadership

- 2021 **Vice-President**, Natural Science Club *Habib University*
- 2021 **Representative**, Academic Affairs (Student Government) *Habib University*
- 2019 **Organizing Committee**, Google I/O Extended - Karachi *Habib University*