

Maleeha Masood

Ph.D. Candidate

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🌐 <https://maleehamasood.github.io>

Interests

Multi-Agent Workflows, Large Language Models, Vision Language Models, Short Video Streaming, Recommender Systems, Content Distribution Networks, Satellite Networks, Distributed Systems

Education

2021 – **Ph.D. in Computer Science**, University of Illinois Urbana-Champaign
Advisors: Profs. Indranil Gupta and Deepak Vasisht

2017 – 2021 **BS in Computer Science**, Lahore University of Management Sciences
Advisors: Profs. Ihsan Ayyub Qazi and Zafar Ayyub Qazi
GPA: 3.96/4.0, On Dean's Honor List

Publications

Under Review Designing CDNs for Short Video Delivery Systems
Maleeha Masood, Shreya Kannan, Om Chabra, Deepak Vasisht, Indranil Gupta

CHI 2026 Counting How the Seconds Count: Understanding Algorithm-User Interplay in TikTok via ML-driven Analysis of Video Content
Maleeha Masood, Shreya Kannan, Zikun Liu, Deepak Vasisht, Indranil Gupta

SIGCOMM StarCDN: Moving Content Delivery Networks to Space

2025 William X. Zheng, Aryan Taneja, **Maleeha Masood**, Anirudh Sabnis, Ramesh Sitaraman, Deepak Vasisht

MobiCom Transmitting, Fast and Slow: Scheduling Satellite Traffic through Space and Time

2023 Bill Tao, **Maleeha Masood**, Indranil Gupta, Deepak Vasisht

JMIR 2021 Technology, Privacy, and User Opinions of COVID-19 Mobile Apps for Contact Tracing: Systematic Search and Content Analysis
Mahmoud Elkhodr, Omar Mubin, Zainab Iftikhar, **Maleeha Masood**, Belal Alsinglawi, Suleiman Shahid, Fady Alnajjar

Internships

Summer 2025 **Microsoft Research**
Systems and Foundations Group (Mentor: Ganesh Ananthanarayanan)

Research Experience

Microsoft Research

2025 – **Automatic Multi-Agent Workflow Planner**

Designed a learning-based multi-agent planner that optimizes latency, cost, and accuracy tradeoffs in AI workflows

Used ground-truth examples to define objective functions and evaluation metrics for workflow efficiency

Evaluated planner performance under varying workload and resource constraints

University of Illinois Urbana-Champaign

2024 – **Systems for Large Language Models**

Fine-tuned sub-8B LLMs for deployment on resource-constrained edge devices, optimizing latency and memory usage.

Studied deployment failures and performance bottlenecks in real IoT environments using telemetry from Home Assistant.

2022 – **Short Video Delivery Applications and Systems**

Identified new insights regarding recommended videos in short video delivery systems to build a specialized CDN design focused on improving cache hit rate and reducing midgress

Conducted a user study in-person and online via Prolific to get user engagement scores from video sessions and build user profiles for experimentation

Design a new system of analyzing video content that does not rely on user provided descriptions and CV models, and instead uses LLMs that can understand videos

Conducted behaviour analysis on real TikTok users by analyzing the videos they see

User analysis components of this work are published at CHI 2026. The system design work is Under Review

2021 – 2025 **LEO Satellites**

Designed a distributed CDN architecture that allows for quick delivery of content to users via LEO satellite constellations; published at SIGCOMM 2025

Analyzed earth imagery via satellites to design a new downlinking strategy that performs better than the state-of-the-art greedy approach; published at MobiCom 2023

2021-2023 **Mobile Models**

Explored the splitting of several ML models across heterogeneous GPUs

Lahore University of Management Sciences

2021 – 2021 **Social Acceptance of Agricultural Innovation**

Analyzed local Pakistani farmers on Social Media Platforms adopting a new method of agriculture to obtain information about social acceptance of innovative techniques

2020 – 2021 **COVID-19 Contact Tracing Apps**

Built a database of different contact tracing apps across the globe; published at JMIR 2021

2019 – 2021 **Heterogenous and Inclusive Federated Learning**

Modified models using reduction techniques to facilitate the participation of slow and heterogenous devices in the Federated Learning Framework

Awards

- 2021 – Sohaib and Sara Abbasi Computer Science Fellowship
- 2024 Fall 2024 Outstanding Teaching Assistant Award
- 2023, 2024 Travel Grant to SOSP
 - 2024 Attendee at the 2024 CRA-WP Grad Cohort for Women
 - 2023 N2 Women Travel Grant to Mobicom
 - 2023 Travel Grant to NSDI
 - 2022 Travel Grant to OSDI
 - 2021 Erasmus Mundus Joint Master Degrees Student Scholarship (received but declined)
- 2018 – 2021 LUMS Merit Scholarship
- 2017 – 2021 Dean's Honor List
 - 2017 100 Best Applications to LUMS
 - 2017 Outstanding Cambridge Learner Award

Teaching Experience

University of Illinois Urbana-Champaign

- Spring 2025 CS425 Distributed Systems (Radhika Mittal)
- Fall 2024 Lead Coursera TA of CS425 Distributed Systems (Indranil Gupta)
- Spring 2024 CS438 Communication Networks (Deepak Vasisht)
- Fall 2023 Lead Coursera TA of CS425 Distributed Systems (Indranil Gupta)

Lahore University of Management Sciences

- Spring 2021 Head TA of CS382 Network-Centric Computing (Zafar Ayyub Qazi)
- Fall 2020 CS334 Principles and Techniques of Data Science (Ihsan Ayyub Qazi)
- Spring 2020 CS202 Data Structures (Ihsan Ayyub Qazi)
- Fall 2019 CS210 Discrete Mathematics (Imdad Ullah Khan)

Selected Course Projects

University of Illinois Urbana-Champaign

- Spring 2022 Block Devices – CS598 Cloud Storage Systems
 - Worked with block storage devices to improve write latency in ext4 file system

Service

External Reviewer 2024: ACM Transactions on Autonomous and Adaptive Systems

Program Committee 2023: ACM S3 Workshop

Mentorship 2023 - 2024: Shreya Kannan (UIUC Undergraduate)
2023 - 2024: Colin Lane (UIUC Undergraduate, now UIUC Masters Student)
2023: Eric Magutu (UIUC iCAN Student)
2023: Sarah Tanveer (LUMS Undergraduate, now UW-Madison Masters Student)
2023: Ananya Anand (UIUC Undergraduate)

Community Nov 2025: Organized and Moderated Faculty Session at the SysNet Retreat at UIUC
May 2024 - present: Graduate Student Volunteer at SysNet Women @ UIUC
Nov 2023: Organized and Moderated Faculty Session at the SysNet Retreat at UIUC
May 2023: Organized and Moderated Student Session at the SysNet Retreat at UIUC
May 2019 - 2021: Batch Representative at LUMS Student Council