Tajamul Ashraf

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RESEARCH INTERESTS

My research lies at the intersection of model generalization, multi-modal learning, learning from limited data (zero- and few-shot learning), and continual lifelong learning systems. I am particularly interested in building agentic systems that can actively perceive, reason, and interact with complex environments.

EDUCATION

Indian Institute of Technology, (IIT Delhi) — New Delhi, India

Master of Science (M.S. by Research) in Computer Science — June 2024
GPA: 9.28/10.0 Department Rank: 1st
Advisor: Prof. Chetan Arora, Co-Advisor: Prof. (Dr.) Krithika Rangarajan
Thesis title: *Domain Adaptation in Breast Cancer Detection from Mammograms.*

National Institute of Technology, (NIT Srinagar) — Srinagar, India

Bachelors of Technology in Information Technology — July 2022
GPA: 8.34/10.0 Top 10% of the cohort
Advisor: Prof. Janibul Bashir
Thesis title: *Robust DL Models for Analyzing the Impact of Coherent Climatic Factors.*

RESEARCH EXPERIENCE

Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI) — Abu Dhabi, UAE

Research Engineer — Jan 2025 - Current
Host Lab: Prof. Intelligent and Visual Analytics (IVAL) Lab

- Working on MLLM agents focused on *grounding and decision-making* in complex environments.
- Developing *Multimodal RAG* framework for factual and adaptive medical agents.
- Designing RL-based *vision-language alignment* techniques for real-world agentic reasoning.
- Worked on **multimodal reasoning** in LLM agents, including post-training techniques for vision-language alignment, and reinforcement learning based agent interaction with multimodal LLMs.
- Created **Agent-X**, the first large-scale reasoning benchmark designed to evaluate MLLMs across diverse real-world tasks involving perception, grounding, and decision-making.

Microsoft Research (MSR) — Bangalore, INDIA

Research Intern — July 2024 - Dec 2024
Host Advisor(s): Dr. Mohit Jain and Dr. Prachi Jain.

- Worked on Knowledge Graph-based Information Retrieval with RAG.
- Automated LLM pipelines with a semi-structured knowledge base (SKB) for medical chatbots.
- Introduced **Cataract-MSICS** dataset and proposed a phase-conditioned method with pseudo-labeling for surgical tool segmentation.

AI & Robotics Technology Park, I-Hub (ARTPARK) Bangalore, INDIA

Visiting Student Dec 2021 - May 2022

Advisor: Prof. Raghu Krishnapuram.

- Developed an automated washroom cleaning robot `Robojanitor`.
- Designed robust models for pose estimation, detection, classification, and SLAM.
- Developed 3D pose models and REST APIs for production.

Indian Institute of Science (IISc) Bangalore, INDIA

Research Intern Mar 2021 - Sep 2021

Advisor(s): Prof. S.N. Omkar and Prof. Balaji Prabu.

- Developed a novel human pose comparison model to assist yoga teachers during online classes.
- Utilized BlazePose to accurately mark key points of both teachers and students during live sessions.
- Designed a feedback mechanism to compare poses and provide real-time corrections to students.

WORK EXPERIENCE

LEENA AI Remote(WFH), USA

Software Developer I May 2022 - Oct 2022

Line Manager: Anand Prajapati

- Executed full-stack software development for the Product and ML team.
- Worked on cross-functional projects, architecting solutions to meet client requirements.

BSNL ALTTC Delhi, INDIA

Cybersecurity Trainee Jan 2019 - Mar 2019

Line Manager: R.K. Pandit

- Troubleshot and resolved network issues related to Wi-Fi and Bluetooth.
- Implemented security measures and optimized network performance in wireless environments.

TEACHING and ACADEMIC SERVICES

Teaching Assistant | MBZUAI, Abu Dhabi

- Trustworthy Medical Vision (CV8502) | Fall 2025 with Prof. Yutong Xie

Teaching Assistant | Indian Institute of Technology, Delhi

- Computer Vision (COL780) | Spring 2024 with Prof. Chetan Arora (Outstanding TA Award)
- Computer Vision for Robotics (JRL780) | Spring 2024 with Prof. Chetan Arora
- Computer Science Fundamentals and Programming (COL100) | Fall 2023 with Prof. Chetan Arora and Prof. Vireshwar Kumar
- Special Topics in Machine Learning (COL870) | Spring 2023 with Prof. Anurag Mittal

- Data Structures and Algorithms (COL106) | Fall 2022 with Prof. Naveen Garg and Prof. Ashish Chiplunkar

Conference/Journal Activities | Reviewer

- ICCV'25 | ACM MM'25 | MICCAI'25, 24 | WACV'25, 24 | CVIP'23, 22 | HPEC'23
- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Artificial Intelligence
- IEEE Transactions on Parallel and Distributed Systems

Conference Volunteer | Organizer

- Student Volunteer for ACM COMPASS 2025 held in Toronto, Canada
- Served as a program volunteer for CVIP 2023 conference in IIT Jammu, INDIA

Invited Talk | Speaker

- Delivered a keynote talk on *"Multimodal Systems for Vision-Language domains in Advancing Healthcare"* at the BRAIN-AID Seminar, hosted by the College of Medicine, University of Lagos, Nigeria (April 2025).
- Presented two talks on Research Directions, Placements, and Internships to undergraduate IT students at the National Institute of Technology, Srinagar (June 2024).

Pilot Mentorship Program | Mentor

I actively mentor students across various levels, guiding them in academic projects, final year theses, and independent research initiatives, with a focus on helping them achieve strong technical outcomes and potential research publications.

Students (* denotes current)

11. Xiao Wu* | MBZUAI | 2025-26
    Project: *Medical Agents for Reasoning based Visual Question Answering*
10. Akash Nanavaty* | BITS Pilani | 2025-26
    Project: *Efficient Transformer finetuning with RL for perception.*
9. Tejal Kumari* | NIT Srinagar | 2025-26
    Thesis: *Agentic Frameworks for fast retrieval augmented generation*
8. Burhaan Rasheed Zargar* | NIT Srinagar | 2025-26
    Thesis: *Language Translator and Text to Speech tool for Kashmiri*
7. Ifrah Mushtaq, Irtifa Aalam* | Kashmir University, NIT Srinagar | 2025-26
    Thesis: *Automatic Speech Recognition and Phonetic analysis for Kashmiri Language*
6. Mohammad Hashid* | NIT Srinagar | 2025-26
    Thesis: *Efficient Breast Cancer Classification using RL*
5. Abrar Riyaz, Wasif Tak* | NIT Srinagar, Thapar University | 2025-26
    Thesis: *Robust tool segmentation in surgical scenarios*
4. Tawaheed Tarid, Sonia Yadav* | NIT Srinagar | 2025-26
    Thesis: *Grounding-based Multi-object Tracking in Resource-Constrained Devices.*
3. Suhaib Salmani | NIT Srinagar | 2024-25
    Thesis: *VLM-based Masked Learning for Efficient Medical Object Detection.*
2. Rajes Manna | NIT Srinagar | 2024-25
    Thesis: *Source-Free Domain Adaptation using Adversarial Class-Aware Teacher.*
1. Asrar ul Haq | NIT Srinagar | 2023-24
    Thesis: *Transformer-Based Unsupervised Domain Adaptation in a Federated Setup.*

HONORS and AWARDS

- MICCAI 2025 Outstanding Reviewer Award, South Korea
- Awarded ICCV 2025 Travel Grant (Honolulu, Hawaii).
- Awarded ACM Multimedia 2025 Travel Grant (Dublin, Ireland).
- Awarded MBZUAI Travel Grant to attend Agentic-AI Summit 2025 at UCB, California.
- Finalist, Agent-X LLM Agents MOOC Competition organized by UC Berkeley RDI.
- Awarded ACM COMPASS 2025 Registration Grant held in Toronto, Canada
- Secured 2nd place (AED 500 award) in the MBZUAI Department Logo Design Competition.
- Awarded $500 compute grant from alphaXiv for my contributions in LLM research.
- Nominated as Diversity Intern by Microsoft Canada.
- Honorable mention by IIT Delhi for research contributions during my Master's degree.
- Awarded MICCAI 2024 Travel Grant.
- Awarded IIT Delhi Endowment Grant 2024.
- Won India's largest National Entrepreneurship Challenge at IIT Bombay.
- Gold Microsoft Student Learn Ambassador for NIT Srinagar.

TECHNICAL SKILLS

Languages: Python, C, C++, MATLAB, SQL, HTML/CSS, Javascript
Frameworks: PyTorch, TensorFlow, Keras, Scikit-Learn, OpenCV, HuggingFace, Flask
Developer Tools: Git, Docker, VS Code, Visual Studio, PyCharm, Linux

EXTRACURRICULAR and SOCIAL ACTIVITIES

Gold Microsoft Student Learn Ambassador
Actively promoted technology learning and fostered a community of student developers in Kashmir. Organized workshops, webinars, and hackathons to encourage student innovation and collaboration.

Founder Ralith Milth
Established an NGO focused on raising awareness and support for drug abuse prevention and rehabilitation. Spearheaded community outreach programs with local organizations to support affected individuals.

Co-founder AT Talks
Hosting a podcast discussing the intersection of technology and society, featuring expert insights. Managed guest interviews, content strategy, and promotion to grow the podcast's reach and impact.

MEDIA APPREANCES

2025: *A new stress test for AI agents that plan, look, and click.* Read more

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PUBLICATIONS

(* indicates equal contribution, † indicates my role as mentor)

C10 *MIRA: A Novel Framework for Fusing Modalities in Medical RAG.* Code Paper

Jinhong Wang*, **Tajamul Ashraf***†, Zongyan Han, Jorma Laaksonen, Rao Muhammad Anwer

MM 2025 (ACM Multimedia)

C9 *TITAN: Query-Token based Domain Adaptive Adversarial Learning.* Code Paper

Tajamul Ashraf, Janibul Bashir

ICCV 2025 (IEEE/CVF International Conference on Computer Vision)

A5 *Agent–X: Evaluating Deep Multimodal Reasoning in Vision-Centric Agentic Tasks.* Code Paper Data

Tajamul Ashraf*, Amal Saqib*, Hanan Ghani, Muhra AlMahri, Yuhao Li, Noor Ahsan, Umair Nawaz, Jean Lahoud, Hisham Cholakkal, Mubarak Shah, Philip Torr, Fahad Shahbaz Khan, Rao Muhammad Anwer, Salman Khan

arXiv 2025 (Under Review)

A4 *ATR-Bench: Awesome-Domain-Adaptation-and-Federated-Learning.* Code Paper.

Tajamul Ashraf, Mohammed Mohsen Peerzada, Moloud Abdar, Yutong Xie, Yuyin Zhou, Xiaofeng Liu, Iqra Altaf Gillani, Janibul Bashir

arXiv 2025 (Under Review)

A3 *Context Aware Grounded Teacher for Source Free Object Detection.* Code Paper.

Tajamul Ashraf†, Rajes Manna*, Partha Sarathi Purkayastha*, Tavaheed Tariq, and Janibul Bashir. arXiv 2025 (Under Review) Ranked 1st on Cityscapes benchmark (Papers with Code)

A2 *LLM Post-Training: A Deep Dive into Reasoning Large Language Models.* Code Paper.

Komal Kumar*, **Tajamul Ashraf***, Omkar Thawakar, Rao Muhammad Anwer, Hisham Cholakkal, Mubarak Shah, Ming-Hsuan Yang, Phillip HS Torr, Fahad Shahbaz Khan, Salman Khan

arXiv 2025 (Under Review)

C8 *Phase-Informed Tool Segmentation for Manual Small-Incision Cataract Surgery.* Paper.

Bhuvan Sachdeva, Naren Akash, **Tajamul Ashraf**, Simon Mueller, Thomas Schultz, Maximilian WM Wintergerst, Niharika Singri Prasad, Kaushik Murali, Mohit Jain

MICCAI 2025 (Medical Image Computing and Computer Assisted Intervention)

C7 *Enhancing Climate Change Understanding: A Novel Deep Learning Framework with the Climate Change Parameter Model.* Paper.

Tajamul Ashraf, Janibul Bashir

MoSICom 2024 (International Conference on Modeling, Simulation & Intelligent Computing)

A1 *FATE: Focal-modulated Attention Encoder for Temperature Prediction.* Code Paper.
Tajamul Ashraf, Janibul Bashir
arXiv 2024 (Under Review)

C6 *D-MASTER: Mask Annealed Transformer for Unsupervised Domain Adaptation in Breast Cancer Detection from Mammograms.* Code Paper.
Tajamul Ashraf, Krithika Rangarajan, Mohit Gambhir, Richa Gauba, Chetan Arora
MICCAI 2024 (Medical Image Computing and Computer Assisted Intervention)

C5 *HF-Fed: Hierarchical based customized Federated Learning Framework for X-Ray Imaging.* Code Paper.
Tajamul Ashraf, Tisha Madame
MICCAI Workshop 2024 (Deep-Brea3th). Best Student Paper Award!

C4 *TransFed: A way to epitomize Focal Modulation using Transformer-based Federated Learning.* Code Paper.
Tajamul Ashraf, Fuzayil Mir, Iqra Altaf Gillani
WACV 2024 (IEEE/CVF Winter Conference on Applications of Computer Vision)

C3 *PoseWatch: Advancing Real-Time Human Pose Tracking and Juxtaposition with Deep Learning.* Paper.
Tajamul Ashraf, BV Balaji Prabu, OS Jois Narasipura
CVIP 2023 (Computer Vision and Image Processing)

C2 *Climate Change Parameter Dataset (CCPD): A Benchmark Dataset for Climate Change Parameters in Jammu and Kashmir.* Paper.
Tajamul Ashraf, Janibul Bashir
ICDSA 2023 (International Conference on Data Science and Applications)

C1 *An integral computer vision system for apple detection, classification, and semantic segmentation.* Code Paper.
Tajamul Ashraf, Nair Abbas, Mohammad Haseeb, Nadeem Yousuf, Janibul Bashir
ICMV 2022 (International Conference on Machine Vision)

REFERENCES

Prof. Yutong Xie ✉
Assistant Professor
MBZUAI, UAE

Mohit Jain ✉
Principal Researcher
Microsoft Research, India

Prof. Chetan Arora ✉
Professor
IIT Delhi, India