JASKARAN SINGH WALIA

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EDUCATION:

MS in Machine Learning, *Carnegie Mellon University* Aug 2025 – Dec 2026
B.Tech, Computer Science, *Vellore Institute of Technology*, CGPA: 9.05 Apr 2021 - Apr 2025

EXPERIENCE:

Microsoft Research - Research Intern **January 2025 – August 2025**
Built knowledge graphs for cloud incident RCA; reduced triage time by 23% using Graph RAG + LLM inference
Designed AutoTSG-generation pipeline from historical incidents (FAISS); cut TTM by 6 hours across 8 internal teams
Published 2 Industrial track papers on TSG generation and cloud Incident triage with LLM reasoning.

Carnegie Mellon University, Lab for AI and Social Impact- Research Assistant **August 2025 – Present**
Worked on text-guided generative augmentation pipeline that adapts existing medical domain models to domain shifts

Massachusetts Institute of Technology, CSAIL Lab – Visiting Researcher **March 2024 – December 2024**
TactStyle: Enhancing 3D Model Stylization with Realistic Texture Generation for Digital Fabrication
Developed Tactstyle to improve 3D model stylization by inducing tactile properties in objects by heightfield generation by VAEs. Formative & perception study showed 70% lower MSE vs. baseline on 3D objects **(Published in CHI'25)**

Mohamed bin Zayed University of AI, BioMedia Lab – Summer Intern **May 2024 – September 2024**
Title: Won (#3rd) BraTS by MICCAI 24 for 3D Brain Tumor Segmentation
Fully-funded fellow: research globally at BraTS; Made novel, attention-based UNet - schedule-free optimisation & model souping boosting F1-0.19; Won best research award at MBZUAI and #3rd in BraTS (published at **MICCAI'24**)

Assurant (Fortune 300), Data Science Intern **May 2023 – August 2023**
• Built NoSQL + ETL BigData API for 1.6M mnemonics (100+TBs); Used threading + containerization which resulted in 73% faster ingestion on Databricks. Deployed and automated scheduling (airflow) on cloud servers with Docker
• Leveraged PowerBI + process-mining across 34 data sheets; reduced IVR expenses by 17%; automated weekly activity

The University of Cambridge, AFAR Lab – Visiting Intern Researcher **October 2023 - May 2024**
Title: Lifelong multi-modal facial expression analysis using causal replay and multi-task continual learning
Created a novel multimodal - multitask learning architecture utilizing continual learning and causality pruning for feature engineering (minimized catastrophic forgetting by 18%) of facial affect recognition in robots for HCI

Indian Institute of Technology Kanpur, ML-Lab – Summer Intern (SURGE) **May 2023 – October 2023**
Title: Spatially Resolved Multi-Omic Data Integration using Graph-Attention Variational Autoencoder
Led a team to design a novel variational-auto-encoder architecture for high-dimensional (30k+ features), multi-modal data integration. Used GANs to generate synthetic tissue data. Developed a graph self-attention network for downstream & won "Dr. Elizabeth & Dr. Verkey Cherian Award" Best Research competing against 50+ final teams **(IIT'2023).**

The University of Lincoln, UK – Visiting Researcher **Feb 2023 - June 2023**
Title: Optimized Custom Dataset for Efficient Detection of Underwater Trash
Created custom dataset (10k images) utilizing semi-supervised learning addressing shortcomings in Underwater debris datasets; Benchmarked it for underwater debris localization. Presented TAROS'23; published in **(Springer Nature'23)**.

Hewlett Packard Enterprise Singapore - Machine Learning & Cloud Solutions Intern **June 2022 – July 2022**
Hosted cloud-AI microservices on Microsoft Azure, enabling automation & scalability reducing latency by 32%.

National University of Singapore (NUS), Singapore **June 2022 – July 2022**
Title: Vulnerability analysis of Captchas using deep learning | ECG classification for arrhythmia detection
• Created an explainable AI model detecting vulnerabilities in captchas to prevent DDoS attacks (**IEEE '24**)
• Utilized ECG signal data to classify arrhythmia with CNNs & signal processing improving F1 by 10%+ from baseline.

Vellore Institute of Technology, India **July 2022 – March 2023**
Title: Deep Learning Innovations for Underwater Waste Detection: An In-Depth Analysis
Review paper: Benchmarked performance and efficacy of current methodologies (classical neural-architectures vs YOLO models) on datasets reviewing 200+ literature in domain of underwater trash detection **(IEEE'24)**

SKILLS:

Python, PyTorch, TensorFlow, scikit-learn, Transformers, CLIP, VLMs, LoRA, RAG, GNNs, GANs, Azure, Kusto, Databricks, SQL/NoSQL, R, Java, C/C++, Node, React, Docker, FastAPI, PowerBI/Tableau, Prompt Engineering, Git,

SELECTED RESEARCH PAPERS (Total 22 papers with 42 Citations and 4A*):

Published:

- TactStyle: Enhancing 3D Model Stylization with Realistic Texture Generation for Digital Fabrication [ACM-CHI'25]
- FUSION: Frequency-guided Underwater Spatial Image recOnstructioN [CVPR workshop - Image Enhancement '25]
- Optimizing Brain Tumor Segmentation with custom MedNeXt: BraTS SSA and Pediatrics [MICCAI'24]
- SAG-VIT: Scale-Aware, High-Fidelity Patching with Graph Attention for Vision Transformers [Springer CIS(IF:4.6)]
- Optimized Custom Dataset for Efficient Detection of Underwater Trash [TAROS '23, Springer Nature]
- Deep Learning Innovations for Underwater Waste Detection: An In-Depth Analysis [IEEE Access]
- Vulnerability analysis of captcha using Deep learning [IEEE-ICTBIG'23]
- ECG Classification System for Arrhythmia Detection with Convolutional Neural Networks [Arxiv'22]

Submitted (under review):

- TSGen: Automated Troubleshooting Guide Generation from Cloud Incident [FSE'26]
- Triangle: Empowering Incident Triage with Multi-LLM-Agents [FSE'26]
- PeerCoPilot: A Language Model-Powered Assistant for Behavioral Health Organizations [Neurips'26]
- Predicting Liquidity-Aware Bond Yields with Causal GANs and Reinforcement Learning with LLMs [AAAI Hack]
- ConFAR: Causal Pruning for Continual Facial Affect Recognition under Multitask Learning [IEEE FG'25]
- Cross-lingual transfer of multilingual models on low-resource African Languages [COLING'25]
- SAGE: Self-Attention Guided Augmented Embeddings for Low Resource Sentiment Classification [ACL' 25]
- Afro-Distilled XLMR for Masked Language Model Augmentation [ACL' 25]
- Spatially Resolved Multi-Omic Data Integration using Graph-Attention Variational Autoencoder [Poster at IIT]
- Histopathological Cancer Stage Transition with Nucleus-Pair Spatial Attention integrated Multi-Stage VAEs [VIT]

AWARDS / EXTRACURRICULAR:

- Featured on a billboard at Times Square, NYC for mentoring in AI & contributions through Topmate.
- Helped students by providing guidance and grew community to 85k on Instagram and 55k on Linkedin.
- Awarded Scholarship (merit based) by achieving a top 3k rank out of 200,000 during undergrad at VIT
- Received scholarship & funding for MS at CMU with research (Research Assistantship)
- Featured in IEEE-Podcasts & multiple talks seminars speaking on AI and Career Guidance.
- Punjab Association, Provided computer science and mathematics classes to students at an orphanage.
- Topmate, Mentor (2024 - 2025): Guided over 500 students (1:1) in AI research and career guidance.

LEADERSHIP:

Travellio, Founder & CEO **August 2023 – August 2024**

• Founded Travellio as a registered startup, grew to a team of 15, utilizing AI (graph-based recommendation systems) to connect travelers across the globe and aggregate trips with importance ranking + deep research + prompt tuning.
• Highest pre-seed offer received was of $600,000 USD of mixed equity-debt funding.

University of Pretoria, Research Assistant & TA (DSFSI Lab) **February 2024 – February 2025**

• Worked as a research Mentor and Teaching Assistant leading 3 Google student developer teams in developing NLP solutions for multilingual low-resource African-language authoring 3 papers with submissions to **COLING** and **ACL**.

Google Developer Community and IEEE RAS Community **November 2022- May 2024**

Lead, Data Science Department

• Held 3 recruitment drives with 1200+ applications & interviewed over 200 people to form a competitive team.
• Hackathon Judge: Evaluated 100+ projects for Google's House of Developers Hack.