Umair Hassan

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Education

Punjab University College of IT (PUCIT), Lahore, Pakistan 2020–2024
Bachelor of Science in Software Engineering
CGPA: 3.71 / 4.00
Relevant Coursework: Data Structures & Algorithms, Distributed Systems, Databases, Machine Learning, AI & Computer Vision

Publications

Umair Hassan. *COCO-Urdu: A Large-Scale Urdu Image-Caption Dataset with Multimodal Quality Estimation.* Submitted to ICLR 2026.
arXiv:2509.09014.

Research Projects

ViT-Insight: Vision Transformer Attention Explorer 2025
GitHub
- Developed an interactive platform to visualize per-layer attention maps and compute Attention Rollout in ViT models, tracing how input patches collectively contribute to model predictions across layers and heads.
- Implemented multi-label support, layer-range selection, and customizable heatmap overlays, enabling detailed exploration of transformer behavior and interpretability for individual images and classes.
- Generated dynamic GIFs to demonstrate layer-wise attention evolution, facilitating analysis of attention patterns and model decision pathways.
- Enhanced transparency and trust in transformer-based vision models, providing a tool for explainable AI research and evaluation of vision-language alignment.

Valorant Object Detection with Google PaliGemma 2025
GitHub
- Fine-tuned Google PaliGemma-2 (3B multimodal model) using QLoRA (4-bit quantization) for domain-specific object detection in Valorant gameplay.
- Built inference pipeline with Hugging Face Processor + Model APIs; evaluated performance using IoU, mAP@[0.50:0.95], AP@0.50/0.75, Accuracy, and Recall.
- Achieved 61% improvement in overall mAP; largest gains on small objects (+75%) indicating strong detection of critical small targets.
- Released fine-tuned model publicly on Hugging Face for reproducibility and benchmarking.

Industry Experience

Motive Inc. (formerly KeepTruckin), Backend Software Engineer (L2) Aug 2024–Present
Remote, San Francisco, CA
- Spearheaded automation for promotional campaigns (Ruby on Rails, Go, PostgreSQL), boosting ATPV from \$500M $\rightarrow$ \$800M and raising in-network transactions from 42% $\rightarrow$ 55%, saving \$1M+ in discounts.
- Built a secure SFTP/FTP integration library in Ruby and data ingestion pipelines (250K records/day) with AWS S3, SQS, Docker, and Kubernetes.
- Integrated an OCR model into Mastercard transaction spend breakdown using customer receipts, boosting categorization accuracy and reducing financial discrepancies.
- Acted as primary on-call engineer for transaction gateways, pricing pipelines, and APIs, leveraging Datadog, Kibana, and Python to triage and resolve live issues under strict SLAs.
- Enhanced observability via Datadog, Redash, and dynamic alerting, improving incident response time and reducing noise.

Other Experience

CC-211 Object Oriented Programming, *Teaching Assistant* Spring 2024
CC-211-L Object Oriented Programming Lab, *Teaching Assistant* Spring 2024

Achievements	Represented Pakistan at the **ICPC Asia West finals** — Certificate.

Achievements   Represented Pakistan at the **ICPC Asia West finals** — Certificate.
Secured Gold (2024) and Silver (2025) medals at the ICPC Asia Topi Regionals — Gold Certificate — Silver Certificate.
Ranked 7th nationally (solo) in Meta HackerCup 2023.
Recognized among the Top 1% IT graduates by HEC Pakistan.
Achieved multiple podium finishes in national programming competitions (PUCON'23, INMIC'24, DAIRA'24, Electrocon'24, Technocon'24, BrainX'24); related medals, trophies, and certificates are listed on LinkedIn Awards.

Community Involvement

PUCON'24 Programming Competition, *Judge & Problem Setter*	June 2024
Google Developers Student Club PUCIT, *Mentor*	April 2024-June 2024

References

Dr. Syed Muhammad Ali
Assistant Professor of Computer Science at PUCIT Lahore, **Email:** muhammad.ali@pucit.edu.pk

Dr. Muddassira Arshad
Assistant Professor of Computer Science at PUCIT Lahore, **Email:** muddassira@pucit.edu.pk

Prof. Abdul Mateen
Assistant Professor of Computer Science at PUCIT Lahore, **Email:** amateen@pucit.edu.pk