AHMAD JARRAR KHAN

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EDUCATION

Masters in Computer Science September 2022 - Present
EPFL, Switzerland CGPA: 5.21/6.0

Bachelors in Computer Science September 2018 - July 2022
National University of Science and Technology (NUST), Islamabad CGPA: 3.9/4.0
School of Electrical Engineering and Computer Science (SEECS)

· President's Gold Medal: Ranked 1^{st} out of 133 students

· Excellence Scholarship for 7 Semesters

RESEARCH PROJECTS AND PUBLICATIONS

Temporally Compressed 3D Gaussian Splatting for Dynamic Scenes Sep 2024 - Dec 2024
Research Project (CVPR - Under Review) *CVLAB, EPFL*

· **Ahmad Jarrar Khan**, Saqib Javed, Corentin Dumery, Chen Zhao, Mathieu Salzmann
· Compressed dynamic 3D Gaussian scenes by upto 67 times while preserving rendering quality.

Video Stylization using Neural Cellular Automata Feb 2024 - Jun 2024
Research Project (To Be Submitted) *IVRL, EPFL*

· Developed a generalized NCA for stylizing videos.
· Created an image stylization web app and deployed NCA to be used in browsers.

Improving 3D Gaussian Splatting using depth May 2023 - Nov 2023
Research Project *IVRL, EPFL*

· Improved the implicit 3D Gaussian representation of 3D objects using sparse-to-dense depth predictions.

Fusion of Knowledge and Data for Time Series Forecasting May 2021 - Jul 2022
Final Year Project *SEECS, NUST*

· Developed methods to incorporate knowledge, simulated by statistical methods, with machine learning models for better predictions.
· Worked on a Residual CNN with a Bayesian layer for enhanced performance on risk estimates.

WORK EXPERIENCE

Johnson Electric, Murten, Switzerland Jul 2023 - Sep 2023
AI Intern

· Created pipeline for calibrating quality testing systems with synthetic images using Diffusion models.
· Developed a chatbot using LLM with relevant document search and retrieval for trustworthy question answering.

Vyro.ai, NSTP, Islamabad Jul 2021 - Aug 2021
Machine Learning R&D Intern

· Worked on image segmentation, depth estimation and image super-resolution for image editing apps.

· Optimized Neural Networks of different domains for deployment on mobile devices.

PROJECTS

LLM for STEM Question Answering Feb 2024 - Jun 2024

· Fine-tuned Phi-2 LLM using Direct Preference Optimization (DPO) to answer science questions.
· Used QLoRA and Quantization for efficient Training and Inference.

Vision Is All Need Feb 2024 - Jun 2024

· Trained quadcopter to fly through obstacle course using Reinforcement learning.
· Trained drone to fly using only vision sensing by imitating a trained policy.

Quantization for 6D Pose Estimation Models Oct 2022 - Dec 2022

· Increased computation efficiency and reduced size of HybridPose pose estimation network.
· Adaptive quantization capable of being dependent on hardware limitations without significant loss of accuracy using techniques defined in AdaBits.

Smartphone Brands Presence on YouTube Oct 2022 - Dec 2022

· Analyzed historic YouTube videos metadata for interesting insights on largest smartphone brands.
· Created a pipeline for data handling, hypothesis testing and text analysis.

Art Generation using GANs Oct 2019 - Dec 2019

· Generated new artworks using Auxillary Classifier Generative Adversarial Network.
· Preserved diversity of images in the same class using batch-independent layer norm.

Search Engine Nov 2019 - Dec 2019

· Implemented a search engine based on *The Anatomy of a Large-Scale Hypertextual Web Search Engine by Sergey Brin and Lawrence Page.*
· Created efficient data structures for indexing and searching of more than hundred thousand articles.

LANGUAGE SKILLS

Urdu: Native Language

English: Fluent, IELTS Score: 7.5 (L: 8.5, R: 8.5, W: 6.5, S: 7)