Peshawar, Pakistan
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Taneem Ullah Jan

Research Interests

Passionate about designing and advancing intelligent computer vision systems, specifically harnessing neural rendering methods for diverse uses such as enhancing video sythesis and refining head avatar representations.

Education

University of Engineering and Technology Peshawar, Pakistan

Bachelor Studies in Computer Science Sep. 2018 – Sep. 2022

Thesis: HTML Code Generation from Image with Deep Neural Networks
Advisor: Dr. Zakira Inayat
CPGA: 3.58/4.0

Research & Publications

Taneem, U. J., Ayesha, N., and Zakira, I. Deep Image In–Painting: Generative Vs. Recurrent Models. 2023. JEAS UET Peshawar.

Taneem, U. J., and Zakira, I. HTML Code Generation from Images with Deep Neural Networks. 2022. JEAS UET Peshawar.

Papers in preparation

Anas, Z., **Taneem, U. J.**, Ahmad, A., and Tahreem, R. Neural Radiance Fields (NeRF) in Depth: An Exhaustive Review of 3D Vision Applications. 2023.

Taneem, U. J., and Ayesha, N., Lip Synchronisation with Multi–Modal Diffusion Models. 2023.

Research Projects

lipsync2: Talking Face Generation with Most Accurate Lip Synchronisation

- Using advanced deep learning and techniques, I formulate lipsync2, a project focused on generating highly realistic talking head videos with precise lip synchronization, aiming to supersede existing versions.
- Utilizing state–of–the–art neural rendering and lip–sync algorithms, we achieved unparalleled precision in aligning lip movements with associated audio. This ensured a seamless visual experience, enhanced by superior video resolution, made possible by our ensemble network approach.
- I completed all research and development for this project alone at **BHuman AI**. The model is in production for the paid persona users.

face–swapping: Swapping Faces in a Video from a Source Image

- Developed an image reenactment and neural head avatar system based on one–shot learning, capable of generating realistic face swapped videos from a still image as a driving input.
- This work aims to develop a framework for transferring the identity of any source face into a target while preserving the target face's unique mark–points such as eye contact and facial expressions, which is an improvement over previous methods that lack this ability, that too in high quality resolution.

face2face: One–Shot Talking Head Video Generation from a Source Image

- Using neural rendering and neural head avatars methods, I developed a project aimed at generating a realistic and dynamic talking head video from a single still image, using a video of your choice as the driving input.

- With this work, we achieved high resolution output videos, in 1080p without using StyleGAN and or any other similar models to enhance the low–resolution quality video instead of generating it directly.
- I completed all research and development for this project alone at **BHuman AI**.

Experience

BHuman AI — New York, USA
Research AI Engineer — Jan. 2023 – present

- Currently working on the development of personalised AI for 1–to–infinity conversational videos, utilising deep learning and computer vision to improve and innovate Neural Head Avatar and Image Reenactment algorithms. The objective is to bring the conversational videos to new heights by making it more natural and personalised.
- I have been collaborating with my colleagues in the AI Team to develop novel techniques and implement state–of–the–art methods in this field. Our collective efforts are aimed at publishing our findings and contributing to the advancement of this exciting area of research, and developing actual products around them all.

CS&IT AI Lab UET Peshawar — Peshawar, Pakistan
Student Research Assistant — Jan. 2022 – Oct. 2022

- Worked on deep generative models, including transformers for vision and text, and image processing through deep neural networks. Conducted studies on mathematical optimisation and evaluation techniques to improve the consistency of machine learning models.
- I made valuable contributions in research related to Visual Entailment. Working with my advisor, I was able to successfully published my research thesis and one additional study in the UET JEAS journal. Through this experience, I gained valuable skills in research methodology, academic writing, and effectively communicating scientific findings which have prepared me for continued success in the field of research.

NAECO Blue GmbH — Bad Schwartau, Germany
Intern Machine Learning Engineer *web* — Aug. 2021 – Nov. 2021

- Conducted research and evaluation study of intelligent and numerical weather models and their APIs to support the company's data needs, resulting in the implementation of a data pipeline that reduced the research and development time by almost half.
- Developed analytical tools and machine learning models to aid in the selection of the best spatial and temporal resolution data for specific locations. I have gained experience in the application of machine learning in industry and working in a collaborative team environment outside academia.

Skills

- **Programming Languages**: Python, C++, MATLAB, MySQL, LaTeX, Bash Scripting
- **Frameworks/Packages**: PyTorch, TensorFlow, Keras, NumPy, OpenCV, Scikit–Learn
- **Developer Tools**: Git, WandB Monitoring Dashboards, GCP, AWS
- **Conceptual Topics**: Nerual Rendering, Head Avatars, Neural Capture & Synthesis, NeRF

Awards & Honours

- Ranked second, Intermediate Computer Science, Government College Peshawar Batch 2016^{th}
- Ranked second, BS Computer Science; Batch 18^{th} University of Engineering and Technology
- Young Undergrad Researcher Award for Bachelor Thesis in Computer Science
- Remain the head of technical team at Google Developer Student Club for two years
- Language Ambassador for Pashto at Cohere For AI —— AYA Project