TANEEM ULLAH JAN

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RESEARCH INTERESTS

Interested in formulating and developing intelligent systems with a special emphasis on machine translation for a range of applications, including generalisation and code generation using domain adaptation techniques. In an effort to push the limits of AI, I am also into modelling new algorithms, approaches for optimisation and evaluation at the intersection of computer vision and natural language processing.

EDUCATION

University of Engineering and Technology Peshawar, Pakistan Sep. 2018 – Sep. 2022
Bachelor Studies in Computer Science

Advisor: Dr. Zakira Inayat
Research Thesis: HTML Code Generation from Images with Deep Neural Networks
CGPA: 3.58/4.0

Government College Peshawar, Pakistan Sep. 2016 – June. 2018
Intermediate in Computer Science

WORK EXPERIENCE

BHuman AI Jan. 2023 – Present
Research AI Engineer *New York, USA*

- Currently working on the development of personalised AI for 1-to-infinity conversational videos, utilising deep learning and computer vision to improve LipSync and Neural Head Avatar technologies. The objective of this work is to bring the conversational videos to new heights by making it more natural and personalised.

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

- Worked with Dr. Zakira Inayat 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.
- Developed and implemented deep learning architectures for research work at the intersection of computer vision and natural language processing, with a focus on Visual Entailment, Visual Grounding, and Contextual Intelligence. Emphasised on reproducing state–of–the–art results and gaining expertise in data generative and pre–trained transformer models to support the advancement of these cutting–edge fields.

NAECO Blue GmbH Aug. 2021 – Nov. 2021
Machine Learning Engineer (Summer Internship) *web* *Bad Schwartau, Germany*

- Conducted research and evaluation 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.

RESEARCH

Programming Code Generation from Documentations *web* Jan. 2023 – Present

- Manipulating natural language to code generation approaches to generate code from official documentations rather than publicly available repositories, to avoid any licensing and maintain genuineness.
- With this we're taking a different approach from currently available code generation models that are either learn the translation between input and output implicitly from naturally occurring patterns of inter–related natural language and code or learn directly from input–output pairs provided as training code data.
- Herewith, our proposed method will generate code by firstly learning to retrieve it from documentation.

HTML Code Generation from Images with Deep Neural Networks *web* Dec. 2021 – Aug. 2022

- Applying the machine translation and image captioning techniques to convert images into words and sentences with the use of deep neural networks.
- Inspecting and featuring images with Convolutional Auto-Encoder, to encode them into lower dimensional space and features.
- Decoding and mapping those lower level features with Sequential Networks to generate HTML codes. The results achieved are higher and more accurate than the paper comparatively, published with 77%.

Deep Image In-Painting: Generative Vs. Recurrent Models *web* Oct. 2022 – Jan. 2023

- Improving context encoders by executing several major training tricks on Generative Adversarial Networks and remodel the network to Wasserstein–GAN.
- Comparative testing of encoders and discriminators based models on top of state-of-the-art models against basic CNN architectures is carried out.
- Proposed a Row–Flattened LSTM from Pixel–CNNs to show how a simpler model can achieve good results. The $L2$ loss acquired here by this proposed model is 4.26 as compared to the others with lowest of 5.27

LaTeX– Formula Code Generation from Images *web* Sep. 2022 – Nov. 2022

- Combining both Computer Vision and NLP tasks to generate mathematical formulae from images.
- The convolutional encoder captures and extracts inner features from images. And an LSTM based decoder then tries to generate the LaTeX–code from the passed token vectors along with Soft Attention Mechanism to enhance the performance. A *BLEU* score of 78% is achieved accompanying by 62% of image edit distance.

TECHNICAL SKILLS

Languages:	Python, C++, MATLAB, MySQL, LaTeX
Frameworks/Libraries:	PyTorch, TensorFlow, Keras, NumPy, OpenCV, Scikit-Learn, (Mastering JAX)
Developer Tools:	Git, Jupyter Notebooks, WandB Monitoring Dashboards, Google Cloud Platform

PROFESSIONAL CERTIFICATES

Deep Learning Specialisation from deeplearning.ai Nov. 2020
Coursera

Machine Learning from Stanford University Jan. 2021
Coursera

Mathematics for Machine Learning from Imperial College London Dec. 2022
Coursera

MISCELLANEOUS

- Ranked *Second*, Intermediate Computer Science, Government College Peshawar Batch 2016th July 2018
- Ranked *Second*, BS Computer Science; Batch 18th University of Engineering and Technology Oct. 2022
- *Young Undergrad Researcher* Award for Bachelor Thesis in Computer Science Oct. 2022
- Remain the head of technical team at Google Developer Student Club for two years Dec. 2020 – Sep. 2022