Avik Pal

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Education

University of Amsterdam, Amsterdam, Netherlands **Sep. 2022 – Jul. 2024**
Master of Science in Artificial Intelligence, ELLIS MSc Honours *CGPA – 8.55 (cum laude)*
Thesis title: Compositional Entailment Learning for Hyperbolic Vision-Language Models *Grade – 9*
Advised by: Prof. Pascal Mettes and Prof. Fabio Galasso

Sapienza University of Rome, Rome, Italy **Mar. 2024 – Apr. 2024**
ELLIS Amsterdam sponsored research visit to the Perception and Intelligence Laboratory (PINlab)

Visvesvaraya National Institute of Technology, Nagpur, India **Aug. 2016 – Jun. 2020**
Bachelor of Technology in Electronics and Communications Engineering *CGPA – 8.01*
Thesis title: Music composition using Deep Learning methods *Grade – 10*
Advised by: Dr. Snigdha Bhagat and Prof. Saugata Sinha

Academic Research and Publications

Compositional Entailment Learning for Hyperbolic Vision-Language Models | *Thesis* **Nov. 2023 – Jul. 2024**
- Developed a novel method to embed naturally hierarchical vision-language data in hyperbolic representation space.
- Best hyperbolic vision-language model to date, with hierarchical and interpretable organization.
- Paper submitted to NeurIPS 2024 and under review.

In-Context Learning Improves Compositional Understanding of VLMs | *ICMLW 2024* **Apr. 2024 – Jun. 2024**
- Compared contrastive and generative models in compositional understanding tasks.
- Proposed in-context learning and chain-of-thought prompting strategies to improve model performance.
- Published – M. Nulli, A. Ibrahimi, **A. Pal**, H. Lee, and I. Najdenkoska. In-Context Learning Improves Compositional Understanding of Vision-Language Models. In ICML 2024 Workshop on Foundation Models in the Wild, 2024.

Improving Noisy Fine-Grained Datasets using Active Learning | *CVPRW 2024* **Nov. 2023 – Jan. 2024**
- Employed active learning techniques to clean fine-grained but noisy image classification datasets.
- Published – **A. Pal**. Improving Noisy Fine-Grained Datasets using Active Label Cleaning Framework. In CVPR 2024 Workshop on Vision Datasets Understanding, 2024.

Addressing the Long-Range Interaction problem in GNNs | *Blog* **Apr. 2023 – Jun. 2023**
- Analyzed the long-range interaction problem prevalent in deep GNN networks and proposed methods to tackle them.

[RE] Label-Free Explainability techniques for Unsupervised Models | *MLRC 2022* **Jan. 2023 – Feb. 2023**
- Reproduced results of Crabbé et al. (2022) and extended methods for other data modes and ablations.
- Published – V. Pariza, **A. Pal**, M. Pawar, and Q. S. Faber. [Re] Reproducibility Study of "Label-Free Explainability for Unsupervised Models". Machine Learning Reproducibility Challenge 2022, ReScience C Journal, July 2023.

Experience

University of Amsterdam **Aug. 2023 – Apr. 2024**
Teaching Assistant *Amsterdam, Netherlands*
- Computer Vision 1 (2023); Information Retrieval 1 (2024). Hosted labs, prepared assignments, and graded students.

NVIDIA Vertical, Quantiphi **Feb. 2023 – Jun. 2023**
Machine Learning Intern *Amsterdam, Netherlands*
- Built a Conversational-AI pipeline with customized and prompt-tuned GPT3 LLM for digital avatars.
- Served as an NVIDIA NVPS Partner. Upskilled NVIDIA DGX customers on deep learning methods.

NVIDIA Applied Research, Quantiphi **Aug. 2020 – Aug. 2022**
Machine Learning Engineer *Mumbai, India*
- Developed AI-assisted musical instruments to help autistic people play music, collaborating with professional musicians.
- Built a video analytics pipeline that forms the AI backend for biometric screening software.
- Worked on speech translation use cases combining automatic speech recognition, machine translation, and text-to-speech.