VRINDA KOHLI

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EDUCATION

Bachelor of Technology, Manipal University Jaipur   2020 - 2024
Computer Science Engineering   CGPA : 9.31
Minor: Data Science

RESEARCH EXPERIENCE

Research Assistant   August 2023 - Current
BITLab, Boston University   Supervisor: Dr. Dokyun (DK) Lee

- Conducted an extensive literature review on applications of LLM-backed agents as simulations for real world ideologies.
- Contributing to a LangChain based multi-agent environment for further experimentation on demographic-specific agent behavior.

Undergraduate Researcher   July 2023 - Current
University of Washington   Supervisor: Dr. Fatemehsadat Mireshghallah

- Participated in Differential Privacy related experiments with generative language models.
- Replicated primary NLP baselines on additional datasets.

Research Intern   May 2023 - August 2023
Delhi Technological University   Supervisor: Dr. Rahul Katarya

- Proposed DistilBERT based architecture for Metaphor Detection with competitive performance to larger models.
- Implemented and validated 2 recent research papers on Metaphor Detection, achieving 2% average accuracy improvement over existing methods

Undergraduate Researcher   Jan 2023 - July 2023
Manipal University Jaipur   Supervisor: Mr. Harish Sharma

- Developed a lightweight algorithm agnostic to various JPEG compression techniques, enabling efficient detection of AI-generated art on social media platforms.
- Demonstrated exceptional performance in the detection of AI-generated art by achieving competitive results (over 90% accuracy) while utilizing less than 20% of the training data typically required, showcasing the effectiveness of the algorithm in resource-constrained environments.

Research and Development Intern   July 2022 - Nov 2022
Trish-i, IIT Mandi Catalyst   Supervisor: Mr. Lakshay Sharma

- Designed and implemented Convolutional Neural Network (CNN) models, utilizing YOLO and VGG architectures, to predict 5 bone health conditions with up to 94% accuracy using Tensorflow and Keras and deployed Flask applications.
- Finetuned aforementioned models, leading to an 11% performance spike.

RESEARCH PROJECTS

Cracking the Figurative Code: A Survey of Metaphor Detection Techniques   Presented, ADCIS 2023

- Survey paper on automated metaphor detection accepted for presentation and publication in the conference proceedings of ADCIS'23 (September, 2023).
- Analyzed and categorized 15 prevalent approaches into three categories, providing insights into the strengths and weaknesses of each, extracting findings to aid future research.

JPEG-Compression Agnostic Identification of Generative Art *Under Review*

- Achieved over 90% accuracy on the detection of art generated by StyleGAN2 and Stable Diffusion by using a novel combination of Image Processing and traditional Machine Learning techniques.
- Designed and implemented a cutting-edge hybrid model that combines ensemble classifiers with CNN architectures. Achieved exceptional accuracy of 98%, maintaining robust performance even in the presence of JPEG compression typically encountered on social media platforms.

Forecasting Wind Turbine Power Generation *Under Review*

- Performed a comparative analysis of time series forecasting using LSTM networks and hybrid Transformer models.
- Demonstrated the superior forecasting capabilities of attention augmented hybrid models in terms of both speed (25% faster) and reliability (similar accuracy).

PERSONAL PROJECTS

ART-ViT : *A vision transformer implementation for art classification.* GitHub

- Used Python and PyTorch to implement ab initio the ViT model outlined in the original research paper.
- Finetuned Vision Transformers to gain a test accuracy of 92% .

ShakespeareGPT : *Generatively Pretrained Transformer for generating Shakespearean-style quotes.* GitHub

- Explored advance NLP concepts and developed a PyTorch-based GPT model from scratch, including its components such as Multihead Attention.
- Showcased a deep understanding of transformer-based architectures and their applications in natural language generation.

ACADEMIC ACHIEVEMENTS

- Dean's List (Semesters 5 and 6)
- Received the Academic Excellence Award at Manipal University Jaipur.

POSITIONS OF RESPONSIBILITY

Vice President, The Music Club, MUJ June 2022 - May 2023

- Lead a student organisation of 350+ students, organised 7 large scale events, helped conduct workshops to boost the music culture of the university.

Writer's Society Head, LITMUS, MUJ May 2021 - May 2022

- Conducted 8 workshops and feedback sessions which helped 50+ students improve their writing skills.

TECHNICAL SKILLS

Languages	Python, C/C++, JavaScript, SQL
Frameworks & Libraries	PyTorch, PyTorch Lightning, Flask, Scikit-Learn, NLTK, spaCy, OpenCV
Tools	Git, Linux, Figma, MySQL