

VRINDA KOHLI

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EDUCATION

Bachelor of Technology, Manipal University Jaipur
Computer Science Engineering
Minor: Data Science

2020 - 2024
CGPA : 9.26

EXPERIENCE

Machine Learning Intern
Gloroots, Bengaluru

Jan 2024 - Present

- Executing fine-tuning and prompt engineering strategies to optimize performance of both open-source and closed Language Models (LLMs) for downstream tasks, alongside developing custom Tavily and Langchain based agents.
- Contributing to development of recommender engines with a focus on scalable and low latency reranking algorithms.

Research Assistant

BITLab, Boston University

August 2023 - Dec 2023

Supervisor: Dr. Dokyun (DK) Lee

- Contributed to a LangChain based multi-agent environment for experimentation on inter-agent interactions, using additional tools such as SerpAPI and OpenAI models.
- Imparted 6 demographic specific features to agents and studied their correlation with misinformation spread, observing emergence of real-world patterns in agent behavior.
- Reviewed 8+ papers on the usage of LLM backed Agent Based Modeling and Simulation.

Undergraduate Researcher

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July 2023 - Current

Supervisor: Dr. Niloofar Mireshghallah

- Developed experimentation pipelines for observing the correlation between Differential Privacy and hallucinations in language models for Q/A tasks. [Project on hold]

Research Intern

Delhi Technological University

May 2023 - August 2023

Supervisor: Dr. Rahul Katarya

- Implemented and validated 7 recent research papers on Deep Learning aided Metaphor Detection.
- Achieved 2% average accuracy improvement over existing methods during experimentation.
- Used transfer learning and transformer models for flash flood detection using geospatial raster imaging, improving performance by 8%.

Undergraduate Researcher

Manipal University Jaipur

Jan 2023 - July 2023

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 95% accuracy) while utilizing less than 10% of the training data typically required, showcasing the effectiveness of the algorithm in resource-constrained environments.

Research and Development Intern

Trish-i, IIT Mandi Catalyst

July 2022 - Nov 2022

Supervisor: Mr. Lakshay Sharma

- Achieved up to 94% accuracy using Tensorflow and Keras on bone health condition analysis by using YOLO and VGG models, 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

[[Preprint](#)]

- 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 95% 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.
- Achieved exceptional performance combining ensemble models with CNNs, 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).

Observing the Privacy-Utility Tradeoff in Differentially Private Medical Text Classifiers

Under Review

- Benchmarked performance of transformer models (BERT, DistilBERT and RoBERTa) under varying epsilon privacy budgets.

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](#)

- Developed a barebones PyTorch GPT model from scratch including components such as Multihead Attention.
- Experimented with various tokenizers to compare performances.

PATE implementation : *Semi-supervised Knowledge Transfer for DL from Private Training Data.*

[GitHub](#)

- Implemented the infamous PATE paper for Differentially Private training using PyTorch and PySyft.
- Comparison with DP-SGD on MNIST is underway.

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	PyTorch, PyTorch Lightning, Flask, Django
Databases	PostgreSQL, MongoDB
Tools	Git, Linux, Figma, GCP