VIBHHU SHARMA

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EDUCATION

Carnegie Mellon University, *Pittsburgh, PA* *Dec 2024*
Master of Science in Machine Learning

Indian Institute of Technology (IIT), Madras, *Chennai, India* *Jun 2023*
Bachelor of Technology in Electrical Engineering; ***CGPA: 9.35/10***

SKILLS

- **Languages**: Python, Java, Bash, C++, MATLAB, C, Octave
- **Web Development**: HTML5, CSS3, Javascript
- **Data Analysis**: MATLAB, Octave, NumPy, Pandas, Matplotlib, Keras, TensorFlow, PyTorch
- **Other Libraries and Tools**: ROS, Eagle, Arduino, LaTeX

RESEARCH EXPERIENCE

Natural Language Counterfactual Generation for Indic Languages | Bachelor Thesis, IIT Madras Jan 2023- May 2023
Guide: Prof. Mitesh Khapra *Chennai, India*

- Created a flexible counterfactual generator for Indic Languages with **customizable perturbations**.
- Proved **counterfactual augmentation**'s value in NLP tasks like sentiment analysis and paraphrase identification.

Counterfactual Explanations for Multi-Modal Recommender Systems | Adobe Research May 2022-Oct 2022
Guide: Dr. Gaurav Sinha | Oral presentation at WSDM 2023 *Bangalore, India (Remote)*

- Developed an algorithm to identify the minimal change in an item's image to remove it from a user's recommended list and used CLIP to connect the perturbed image features to textual features in order to lend meaning to the perturbations.
- **Outperformed the existing state of the art** by 4% on **Explanation Fidelity** and 26.5% on **Explanation Number**.

Deep Learning for Extreme Multilabel Classification (XMC) | Aalto University Jun 2021-Nov 2021
Guide: Prof. Rohit Babbar *Espoo, Finland (Remote)*

- Devised a model that made use of a deep **Probabilistic Label Tree** for label clustering and a **Graph Convolutional Network** based on document-document similarity for label ranking to assign correct labels to short text documents.

KEY COURSES

- **Artificial Intelligence/Machine Learning:** Introduction to Machine Learning | Deep Learning for Imaging | Reinforcement Learning | Multi-Arm Bandits | Information Theory
- **Mathematics:** Probability, Statistics and Stochastic Processes | Linear Algebra | Functions of Several Variables | Series and Matrices | Differential Equations | Introduction to Game Theory
- **Programming:** Numerical Methods | Design and Analysis of Algorithms | Applied Programming Lab

KEY TECHNICAL PROJECTS

Tabular Data: Deep Learning is not all you need Mar 2022- Apr 2022
Course Project under Prof. Sheetal Kalyani

- Implemented XGBoost and deep learning models like TabNet, DNF-Net, NODE and 1D-CNN from scratch on 11 different tabular datasets and compared the results to show the efficacy of tree-based ensemble models on tabular data, replicating the results obtained by Shwartz-Ziv and Armon.

Multi-Armed Bandit in a game of Cricket Mar 2022- Apr 2022
Course Project under Prof. Chandrashekar Lakshmi Narayanan

- Used the **Upper-Confidence Bound(UCB)** algorithm to decide effective batting and bowling strategies in a cricket game.

Analysis of Recommendation Systems May 2020- Jul 2020
vRhythms Software Pvt Ltd

- Worked in a team of four to analyze recommendation algorithms' performance on ranking metrics.
- Optimized the performance of traditional collaborative filtering & matrix factorization on ranking metrics by **22**%.
- Analyzed models' susceptibility to **popularity bias & cold start** issue using novelty/coverage metrics.

EXTRA CURRICULAR ACTIVITIES

- Headed a team of 48 students as the **Executive Editor** of the official campus publication of IIT Madras May 2022-May 2023
- Won numerous **national level quizzes**, including Nihilanth 2023, as part of the IIT Madras quiz contingent. Apr 2020-May 2023
- **Mentored** 2 underprivileged students at **Avanti Fellows** in all aspects of their academics. Aug 2019-Sep 2020