

VIBHHU SHARMA

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EDUCATION

Indian Institute of Technology (IIT), Madras , Chennai, India <i>Bachelor of Technology in Electrical Engineering; CGPA: 9.48/10</i>	Aug 2019 - Jun 2023
Army Public School Kirkee, Pune, India <i>Higher Secondary School, Central Board of Secondary Education(CBSE); Percentage: 97.6</i>	Jun 2017 - May 2019
The Bishop's Co-Ed School, Kalyaninagar Pune, India <i>Secondary School, Indian Certificate of Secondary Education(ICSE); Percentage: 97.8</i>	Jun 2015 - May 2017

SCHOLASTIC ACHIEVEMENTS

• Secured All India Rank 539 in JEE (Advanced) out of 200,000+ candidates	2019
• Secured All India Rank 421 in JEE (Mains) out of 1.5 million+ candidates	2019
• Recipient of the prestigious KVPY (Kishore Vaigyanik Protasahan Yojana) scholarship in the SX stream with an All India Rank 421 out of 50,000+ students	2019
• Among the top 30 students from Maharashtra to clear the NSEC , hence qualifying for INChO , as a part of the International Olympiads selection procedure	2019
• Among the top 30 students from Maharashtra to clear the NSEP , hence qualifying for INPhO , as a part of the International Olympiads selection procedure	2019
• School topper in ICSE Class 10 and CBSE Class 12 board exams	2017, 2019

RESEARCH EXPERIENCE

Natural Language Counterfactual Generation for Indic Languages Bachelor Thesis, IIT Madras <i>Guide: Prof. Mitesh Khapra</i>	Aug 2022- Present Chennai, India
<ul style="list-style-type: none">◦ Developed a general-purpose counterfactual generator for Indic Languages that allows for control over both perturbation types and locations.◦ Created a dataset of diverse counterfactuals for 11 Indian Languages.	
Counterfactual Explanations for Multi-Modal Recommender Systems Adobe Research <i>Guide: Dr. Gaurav Sinha</i>	May 2022-Jul 2022 Bangalore, India
<ul style="list-style-type: none">◦ Devised a method to generate counterfactual explanations for recommendations generated by a blackbox recommender system that utilizes both image and review data for its decision.◦ Used CLIP Tokenization and phrase level sentiment analysis to discover the minimum perturbation to an item's image or features such that it would no longer be recommended to a user and framed it as a counterfactual explanation.◦ Model outperformed the existing state of the art on metrics like Probability of Necessity(PN) and Probability of Sufficiency(PS).	
Deep Learning for Extreme Multilabel Classification (XMC) Aalto University <i>Guide: Prof. Rohit Babbar</i>	Jun 2021-Nov 2021 Espoo, Finland
<ul style="list-style-type: none">◦ Explored and reviewed multiple papers on short-text Extreme Classification where the input text is limited to only around 15 words on average.◦ 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.	

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
- **Programming:** Numerical Methods | Design and Analysis of Algorithms, Applied Programming Lab
- **Electrical Engineering** Control Engineering | Microprocessors | Communication Systems | Signals and Systems | Digital Systems | Analog Systems | Sensing Techniques and Sensor Systems,
- **Miscellaneous:** Introduction to Game Theory | Econometrics | Principles of Economics

KEY TECHNICAL PROJECTS

Tabular Data: Deep Learning is not all you need

Mar 2022- Apr 2022

Course Project under Prof. Sheetal Kalyani

- Replicated results from the paper "Tabular Data: Deep Learning is not all you need" by Shwartz-Ziv and Armon .
- 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.

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 game of cricket.

Reinforcement Learning Agent

Apr 2021-May 2021

Course Project under Prof. LA Prashanth

- Designed a RL Agent in Python using conventional RL algorithms, primarily Q-learning with exploration.
- **Tested** out the agent successfully in 3 different environments and their noisy counterparts from BSuite in all the environments.

Analysis of Recommendation System

May 2020- Jul 2020

vRhythms Software Pvt Ltd [\[Code\]](#) [\[Report\]](#)

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

Software Engineer, Team Anveshak

Apr 2020- Aug 2021

Mars Rover Team, IIT Madras

- Implemented algorithms for autonomous navigation and path planning (Bug2, Vector Field Histogram, Dynamic Window Approach), and object detection (spiral searching manoeuvre, YOLOv3) on a ROS Based Framework for a rover capable of withstanding Mars-like conditions and carrying out scientific tasks effectively.
- Tested approaches to the above tasks extensively using Gazebo and RViz.

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

POSITIONS OF RESPONSIBILITY

Executive Editor | The Fifth Estate, IIT Madras

May 2022- Present

- **Oversaw and led a team of 50** correspondents, editors, designers, analysts and coordinators at the official student news media body of IIT Madras
- Supervised the regular rollout of quality written articles, podcasts, research surveys and videos covering campus life at IIT-Madras.

Coordinator and Contingent Member | Quiz Club, IIT Madras

Apr 2020- Present

- Regularly **participate in and conduct** quizzes both inside and outside the institute as a part of one of the most successful teams in the college quizzing circuit.

EXTRA CURRICULAR ACTIVITIES

- Conducted a public workshop on "**Python Algorithms for Robotics**" as a part of Shaastra 2020. 2021
- Provided quality **mentorship** as a part of Avanti Fellows to **underprivileged students** in JNV Puducherry with regard to their academics and entrance exam preparation.Both have cleared JEE Main-2020 with **>99 percentile**. 2019-20
- Wrote articles as a **press correspondent** for The Fifth Estate, the official campus publication of IIT Madras. 2020-22
- Organised a campaign for **Digital Wellness** that included surveying SMEs on their use of digital technology and the assistance they needed as part of the PR team of the Entrepreneurship Cell at IIT Madras. 2020
- Elected as **House Captain** by teachers on the basis of overall academic and extracurricular performance. Led the House in sports and cultural events throughout the year. 2016-17
- Shortlisted among the top 20 students in the country for Indian contingent selection for **World Schools Debating Championship** 2016