

VARUN KUKRETI

First Year (Semester-1) M.Tech. Student
Department of Computer Science & Engineering
Indian Institute of Technology Ropar
Address : Lane No. - 18, Rajeshwar Nagar Phase-2, Sahastradhara Road, Dehradun, Uttarakhand, India - 248001

Email : varunkukreti2002@gmail.com
Phone : +91-9528744366
D.O.B : 07-July-2002

Objective

To implement my knowledge and enhance it further, by securing employment and working in a reputed research organization, by applying my existing skills on the real life tasks and projects. I am interested in the broader applications of **Data Analytics**, **Machine Learning** and **Deep Learning**.

Academic Qualifications

Year	Degree/Exam	Institute	CGPI/%
2024 - 2026 (present)	M.Tech in Computer Science & Engineering	Indian Institute of Technology Ropar	Ongoing
2024	B.Tech in Electrical Engineering	National Institute of Technology Hamirpur	8.48/10
2020	CBSE (XII)	Delhi Public School, Dehradun	97.20%
2018	ICSE (X)	St. Joseph's Convent School, Kotdwara	93.80%

Scholastic Achievements

- Secured **All India Rank 554** (top 0.45 percentage) in **GATE Computer Science and Information Technology 2024** out of 123967 candidates that appeared in the examination. Also, secured **All India Rank 1064** (top 1 percentage) in **GATE Computer Science and Information Technology 2023**
- Qualified **JEE Main 2020** and **JEE Advanced 2020** with good ranks.
- Secured **Second Rank** and **Third Rank** in the state in **International Informatics Olympiad** and **International Mathematics Olympiad** respectively.
- Won **Scholar Badge** award for excellent academic performance in the school.
- Received a **Merit based Scholarship** and several other awards for outstanding academics in the school.

Experience

- University College London and the Institute and Faculty of Actuaries United Kingdom** (Aug'24-present)
Project Collaborator
Guides: Dr. Philip Treleaven and Dr. Malgorzata Śmietanka (Researcher), Department of Computer Science, UCL ;
Working on a project related to implementation of Federated Learning and Computer Vision in financial computing with practical implementations in the financial sector.
- Queen Mary University of London** (June'23-Aug'23)
Remote Research Intern
Guides: Dr. Ahmed Sayed, Dept. of EECS, Queen Mary University of London
Interned during Summer of 2023 with **SAYED-Systems Group** at QMUL and worked on the projects related to **Federated Learning** and **Distributed Music Generation**. The tasks involved analysis of performance metrics of the FL model during the training using WandB, creation of an LSTM model for Music Generation and training the same in a distributed environment.
- Indian Institute of Science Education and Research Thiruvananthapuram** (May'23-June'23)
Project Intern
Guides: Dr. Saptrishi Bej, School of Data Science, IISER Tiruvananthapuram
Worked on studying the role of Neural Network-based synthetic tabular data generation models, namely **TabDDPM (Tabular Denoising Diffusion Probabilistic Model)** and **TVAE (Triple Variational Autoencoder)**, to improve imbalanced classification on Credit Card Fraud Dataset. The dataset was balanced by generation of synthetic samples using these models for the class with lesser number of examples.
- Indian Institute of Technology Hyderabad** (May'22-Aug'22)
Summer Research Intern
Guides: Dr. C. Krishna Mohan and Udaya Kumar Ambati (Research Scholar) , Dept. of AI , IIT Hyderabad
Studied about methods in transfer learning and domain adaptation for information extraction from image datasets in order to establish similarities between the two given datasets. Particularly implemented the concepts of **Optimal Transport Theory**, **Direct Domain Adaptation**, **Gradient-based Class Activation Mapping (Grad-CAM)** and **Autoencoded Average Distance (AAD)** to customized datasets in order to solve real-life problems. Also supporting visualizations to these datasets were provided during the pre-processing of data.
- DeepLearning.AI** (June'22-July'22)
Alpha-Tester (Part Time in Remote Mode)
Tested the codes and reviewed the contents of the online course titled 'Mathematics for Machine Learning Specializaion' offered by **DeepLearning.AI** through online platforms like Coursera.

Major Projects

- **Design and Development of Haptic Feedback System for Visually Impaired Individuals** (Jan'24-May'24)
Semester Project
This project aimed at development of a haptic feedback based wearable device to assist visually impaired individuals in navigation. It uses Arduino Uno along with vibration motors and Ultrasonic sensors to provide real time feedback. Also, an Android application has been developed that works in conjunction with Arduino Uno unit to provide visual feedback along with image recognition and virtual assistance to the individuals to help them in navigation and detection of objects around them.
- **Fault Analysis in Induction Motors using Deep Learning Algorithms** (July'23-Dec'23)
Semester Project
This project aimed at determination of the nature and type of faults that occurs due to multiple reasons in a three phase induction motor. Also, the project tends to examine the performance of various algorithms in fault detection in the two cases scenarios - limited data and sufficient data availability.

Minor Projects

- **Emoji Localization and Identification** (Jul'22-Aug'22)
Independent Project
In this project, a CNN is trained to classify as well as localize emojis in the images. It involves **Object Detection** using a relatively simple CNN with an assumption that there exists only one emoji per image.
- **Twitter Sentiment Analysis** (Jan'22-Mar'22)
Independent Project
This project involves training a **Naive Bayes classifier** to predict sentiments of Twitter tweets. This project is useful to many companies with social media presence that want to predict sentiments of their customers automatically without humans as it saves a lot of time which would otherwise be required to perform such task manually by humans.
- **Book Recommender System** (Oct'21-Nov'21)
Independent Project
This project uses **Collaborative filtering** to recommend books to the users on the basis of inputs provided. This project is of great utility to several organizations that provide online e-resources services such as e-books as it generates a recommended list of books on the basis of past user experiences.

Technical Skills

- **Programming Languages:** C, C++, Python, R, MATLAB
- **Mathematical Skills:** Linear Algebra, Probability, Statistics, Convex Optimizations
- **Deep Learning Frameworks:** PyTorch, Tensorflow and Keras
- **Packages and Softwares :** Numpy, Pandas, Matplotlib, Seaborn, Plotly, Scikit-learn, Beautiful Soup, SymPy, NLTK, OpenCV, WandB, MongoDB, MySQL, SQLite, Tableau, Git
- **Platforms:** Windows and Linux

Relevant Courses

Engineering Mathematics - I, II & III Data Structures and Algorithms Machine Learning by Stanford University (Coursera) Python Specialization by University of Michigan (Coursera) Data Visualization and Communication with Tableau by Duke University (Coursera) Feature Engineering by Google (Coursera)	Mathematical Foundations of Computer Science Discrete Mathematics and Graph Theory Deep Learning Specialization by DeepLearning.AI (Coursera) Data Analysis with R Programming by Google (Coursera) C/C++ Specialization by University of California Santa Cruz (Coursera) Federated Learning by Aalto University (Aalto Courses)
--	--

Extra-Curricular Activities

- Actively participated in several national and international level online programming contests (OPCs), datathons and hackathons and have won the following awards.
 - Awarded **Galactic Problem-Solver** certificate for outstanding performance in the **NASA Space Apps Challenge 2021**.
 - Runner up in **Coding Mania Coding Competition** organised by ISTE Students' Chapter NIT Hamirpur.
- Secured **First position** in **Techy Chiro-a technical writing event** organised by Robosoc (Robotics Society of NIT Hamirpur).
- Received **Best Orator Award** in the **Open House Debate Challenge** on the theme of the impact of COVID-19 on the education sector organised by the English Club of NIT Hamirpur.

Positions of Responsibility

- Engaged actively as a mentor for **DeepLearning.AI** community, a worldwide community of AI and ML enthusiasts, and actively participated in the discussions forums and seminars organized by DeepLearning.AI through virtual mode.
- Served as a member of **Revanta - Motorsport Club Of NIT Hamirpur** during first year during the undergraduate degree and held workshops aimed at discussing the potential benefits of AI in the automobile industry.