Nipun Rustagi

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Education

University of Toronto Mississauga, ON
Honours Bachelor of Science in Computer Science *Aug. 2021 –May 2024*

- **Awards:** UofT Scholar Award

Technical Skills

Languages: Java, Python, JavaScript, C/C++, HTML/CSS, R, Matlab, MySQL
Frameworks: React, Flask, WordPress, Tensorflow, PyTorch
Developer Tools: Git, Google Cloud Platform, VS Code, Firebase
Libraries: Pandas, NumPy, Matplotlib, Sklearn, Seaborn, Tkinter

Experience

Python Developer and Researcher September 2022 – Present
Kidney Health Education and Research Group

- Developing python scripts which on an **automated** basis manage the **data relay** and transformation between external servers and network drive to carry out data quality testing
- Assisting the research data analysts and data engineers to ensure proper integration of any applications built

Research Assistant Aug 2020 – Dec 2020
CHIREC International School

- Researched and developed models with Mr. Mukund, a professor at BITS Pilani, to develop a **Network Intrusion Detection System** integrated with ML algorithms such as **XGBoost** and **Random Forest** to **detect DoS and Probe Network Intrusion Attacks** more efficiently
- Deployed models of **Backward Feature Elimination** and **Principal Component Analysis** that **maximized variance** between components by 40%, leading to a more accurate predictive model
- **Semi-automated** optimized hyper parameter value computation for the algorithms, **decreasing model training time by over 30%**

Full Stack Developer July 2020 – Nov 2020
CHIREC International School

- Led the statistical development of a Neural Network based application that calculates the probability of admission for each university
- Designed a **tkinter-based GUI application** that **resolved** client usability issues to calculate the probability of admission into the university
- **Streamlined** feature elimination by utilizing **BFE algorithm** based on correlational scores of parameters, **decreasing training time by 15%**

Machine Learning Intern Nov 2019 – Mar 2020
Einsite

- Deployed and streamlined a sensor-based software solution for **Object Detection** in construction sites to calculate worker productivity.
- Collaborated with the **Computer Vision** team to annotate the images based on object type such as worker, tractor, boulders
- Facilitated static code analysis and development of an **automated** Python script to **reduce image annotation time by over 50%**

Projects

Optimized Study Plan Scheduler | *JavaScript, Python, Azure SQL*
https://github.com/utmgdsc/schedulr

- Developing a **web-based study** scheduler in collaboration with the **Google Developer's Student Club** at the **University of Toronto Mississauga**, that takes on a student's course timetable for the semester and **auto-generates** a personalized study schedule based on a **greedy genetic algorithm**

Image Transmission via Flask Server | *Java, Python, Flask*
github.com/Nipun0309/Image-Transmission-via-Python-Flask

- Developed an Android-based application that can transmit an image from one device to another connected to the same network via a Flask Server

Optimization Script for TSP | *Python, Flask*
github.com/Nipun0309/Machine-Learning-Projects

- Calculated the optimal path in the Travelling Salesman Problem using ACO algorithm and Graph Theory

Volunteer/ Leadership Experience

Teaching Assistant Oct 2022 – Present
University of Toronto AI Group

- Working as a **Teacher Assistant** to the Director of Education at UofT AI for LearnAI, a course that introduces **Artificial Intelligence** and **Machine Learning** concepts to **University of Toronto undergraduates**
- Developing course-content and hands on projects for LearnAI students, pertinent to **Regression Analysis**, **Convulated Neural Networks**, and **Reinforcement Learning**
- Conducting a and assisting a series of lectures and workshops to teach important concepts and to help ML development skills using libraries such as **PyTorch**