

TUSHAR SAINI

+91 6230027646 ◊ tushar.saini1285@gmail.com

OBJECTIVE

I am a Machine Learning Engineer working on NLP problems. My work involves conducting experiments, investigating, and developing statistical, machine learning, and deep learning solutions. I am highly skilled and have experience working on optimization problems in the logistics supply chain domain. I am well-versed and have practical experience in handling large datasets and its enabling technologies. I am a polyglot programmer who loves solving complex problems. The opportunity to work alongside a diverse group, having expertise in different disciplines fuels my passion for pushing the boundaries of innovation and achieving impactful outcomes.

WORK EXPERIENCE

Application Engineer I, Oracle

Feb 2022 - Till now

Argus Safety, Research and Development Group

- Investigated and developed pairwise learning to rank (pLTR) model which uses contrastive learning to map verbatims to its MedDRA's preferred term and low-level term.
- Exploring BioMed KRIS BERT and Large Language Model for medical and drug coding. Investigating methods to blend pLTR score, Oracle text score, and LLM score for improved accuracy.
- Developed statistical tool as PL/SQL package to investigate document duplicates in Case Intake list.
- Developed customized unbalanced Hungarian algorithm for worklist assignment.

Associate Data Scientist, Cogneau Systems

April 2021 - Jan 2022

Logistics and Supply Chain

- Developed Digital Twin for warehouse resource planning using Monte Carlo simulation which generates multiple reports on resource planning for worst-, average-, and best-case scenarios.
- Developed Replenishment and Transportation Allocation Planner which help maintain sufficient stock to meet the downstream demands with minimal transport cost. We used mixed integer programming to find the most optimal solutions.
- Developed ensemble sales forecasting models for a two-wheeler manufacturer using Facebook Prophet and recurrent neural network (RNN) techniques.

EDUCATION

MS in Computer Science

Aug' 2019 - Jan' 2022

Thesis Title: Modelling Air Quality via Machine Learning and IoT Technologies

Thesis Supervision: Dr. Varun Dutt

Indian Institute of Technology, Mandi. CGPA: 8.7/10

Bachelors in Computer Science Engineering

Aug' 2013 - July' 2017

Guru Gobind Singh Indraprastha University, Delhi, 71.99%

RESEARCH EXPERIENCE

Project Associate, Indian Institute of Technology

July 2019 - Apr 2021

Funded by Department of Environment Science and Technology

- Research and developed an IoT-based Air-pollution Sensing and Warning technology, deployed at hilly terrains of the Himalayas for 24x7 monitoring of air pollution.
- Developed short- and long-term machine learning and state-of-the-art deep learning forecasting model which can forecast pollution concentration.
- Evaluated public perception of people residing at polluted locations in India and their eagerness to adopt technology to mitigate the impact of air pollution.

- Worked on formulating a CNN-based machine learning model to identify vehicular traffic on the road via CCTV footage.
- Conducted an evaluation of vehicular traffic in Ghaziabad, U.P., India, with the objective of devising a road intersection modification plan to alleviate long traffic jams and improve traffic flow.

PUBLICATIONS

Peer-Reviewed Journal Articles

Saini, T., Chaturvedi, P., Dutt, V. (2021). Modelling particulate matter using multivariate and multistep recurrent neural networks. *Frontiers in Environmental Science*, 614.

Conference Proceedings

Saini, T., Tomar, G., Rana, D., Chand, Attri, S., Dutt, V. (2021). A weighted ensemble approach to real-time prediction of suspended particulate matter. In *Communications in Computer and Information Science: Proceedings of the 10th International Advanced Computing Conference (IACC)*, Panaji, Goa. Springer.

Sharma, R., Saini, T., Kumar, P., Pathania, A., Chitineni, K., Chaturvedi, P., Dutt, V.. An Online Low-Cost System for Air Quality Monitoring, Prediction, and Warning. In *Lecture Notes in Computer Science*. Springer.

Book Chapters

Saini, T., Rana, D. C., Attri, S., Chaturvedi, P., Dutt, V. (2021) Forecasting of air pollution via a low-cost IoT-based monitoring system. In Verma K.J., Saxena, D., and Gonzalez-Prida, D.V. (1st Eds.), *EAI/Springer Innovations in Communications and Computing IoT and Cloud for Societal Good*. Springer.

Saini, T., Tomar, G., Rana, D. C., Attri, S., Chaturvedi, P., Dutt, V. (2021) CloudIoT for pollution monitoring: A multivariate weighted ensemble forecasting approach for prediction of suspended particulate matter. In Verma K.J., Saxena, D., Gonzalez-Prida, D.V., and Shendryk, V., (1st Eds.), *CloudIoT: Concepts, Paradigms, and Applications*. CRC Press. (in press)

PATENT

Dutt Varun, Saini Tushar, Kumar Praveen, Pathania Ankush, Rana D. C., and Attri S. C. Low-power, low-cost air-quality monitoring, predicting, and warning system. November 28, 2019. Patent Application 201911048755, New Delhi, Patent Office Dwarka New Delhi 110078.(India)

POSITION OF RESPONSIBILITIES

Teaching Assistantship	Information Technology and Development (HS528) at IIT Mandi
Open Source Volunteer	Mozilla.

SKILLS AND INTERESTS

Programming	C++, Python, PL/SQL, and Dart
ML Frameworks	Torch, Tensorflow, Keras and Scikit.
Skills	Software engineering and development.
Platforms	Linux, Macintosh, and Windows.
Interests	Reading Books (Philosophy, Psychology, and Fictional), Hiking and Trekking