# Aditya Suman

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## SUMMARY

I am a Machine Learning Engineer specializing in developing and optimizing machine learning models and deploying algorithms. Proficient in supervised/unsupervised learning, deep learning, and reinforcement learning and strong background in model evaluation, data preprocessing, and performance tuning. Experienced with Python, PyTorch,C++, scikit-learn, cloud platforms, containerization.

## WORK EXPERIENCE

**IEEE RAS - Junior Coordinator and Core Community | link** 2023 - 2024

- Led hands-on training sessions on Arduino kits for 10+ freshmen, covering embedded C++ , circuit design, and IoT basics.
- Worked on projects such as Line Following Robot , ESP8266 BLE & Wi-Fi Jammer and two-wheeled self-balancing robot.
- Created a centralized event tracking and task delegation website using GitHub Pages, streamlining coordination across the IEEE RAS team and cutting down task completion time by approximately 2 days.

## KEY PROJECTS

**Predicting Object Motion | Github**

- Implemented Kalman Filter algorithm to accurately track objects , in the presence of noisy or inaccurate sensor data , including edge detection and active contour tracking for enhanced object localization.
- Implemented Lucas Kanade Optical Flow algorithm to trace the path of a selected object in video by tracking the motion of feature points across frames.
- An extension of SORT that integrates deep appearance features with Kalman filters and data association techniques for improved multi-object tracking.

**Heart Disease Prediction | Github**

- Trained and fine-tuned models including Logistic Regression, Decision Tree, Random Forest, SVM, KNN, Gradient Boosting, XGBoost, AdaBoost, Naive Bayes, and MLP Neural Network.
- Applied GridSearchCV for hyperparameter tuning to systematically find the best combination of hyperparameters for each model resulting in increased accuracy for models including Random Forest , Gradient Boosting and Multilayer Perceptron which improved model accuracies from 82% to 95% , 84% to 96% , 78% to 92% respectively.
- Deployed the best performing models using MLflow , enabling experiment tracking , model evaluation and streamlined development to production.

**Lunar Lander Simulation with Reinforcement Learning | Github**

- Trained agents using Deep Q-Learning, Vanilla DQN, Rainbow DQN, and Monte Carlo methods.
- Reduced convergence time by 35% from 2000 to 1300 episodes using prioritized experience replay in Rainbow DQN.

**Sentiment analysis using BERT | Github**

- Improved BERT model performance by resolving issues like frozen pre-trained layers and weak classifier design . As a result the F1-score increased from 0.64 to 0.80.
- Addressed overfitting  by monitoring class-specific F1-scores and validation loss , ensuring balanced precision/recall trade offs.
- Developed the model using Hugging Face Transformers , leveraging pre-trained architectures for efficient fine-tuning and performance optimization.

## EDUCATION

**Manipal university Jaipur** 2022-2026
Bachelor of Science , Computer Science Cumulative GPA: 7.5/10

**Delhi Public School BN – Senior Secondary** 2020-2022
CBSE – Physics, Chemistry, Math

## COURSES

**Stanford Machine Learning Specialization (Coursera)**

**Google Data Analytics Specialization (Coursera)**

**Introduction to Quantum Computing – NPTEL (IIT Madras)**
Completed with an Elite Score in a center-based final exam.

**Design and Analysis of Algorithms – NPTEL (IIT Madras)**
Completed with an Elite Score in a center-based final exam.

**Machine Learning - NPTEL (IIT Madras)**
Completed with an Elite Score in a center-based final exam.