Aaditya L. Kachhadiya

Student Researcher in Machine Learning and Applied Mathematics

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DOI (Research Paper): 10.21203/rs.3.rs-7001638/v1

Research Interests

Applied Mathematics (Linear Algebra, Probability, Statistics, Optimization, Calculus); Theoretical and Applied Machine Learning (Supervised, Unsupervised, Self-supervised); Deep Learning and Generalization Theory; Mathematics for Machine Learning; Interdisciplinary Applications of AI, including Physics (e.g., PINNs)

Education

Shardayatan High School, Surat, India
High School Student (Grade 11), 2025 – 2027
- Studying JEE Advanced syllabus with strong emphasis on Physics, Chemistry, and Mathematics
- Delivering technical talk on ML and personal research work (July 2025)

Research Experience

Paper: Beyond Logistic Regression: Calibration With Dropouts In Tiny Neural Networks
Status: Under (checking and) review at Springer Nature (Neural Processing Letters); preprint available
Summary: 27-page solo-authored theoretical + experimental work in ML calibration, dropout methods and generalization on real-world dataset
Link: Research Square Preprint
DOI: 10.21203/rs.3.rs-7001638/v1
Views: 110+   Downloads: 11+

Online Certifications

- **Mathematics for Machine Learning** – Imperial College London (Linear Algebra course)

- **Machine Learning Specialization** – Stanford University (Andrew Ng)

- **Machine Learning with scikit-learn** – INRIA / FUN MOOC

- **CS50's Introduction to Programming with Python** – Harvard University

- **Machine Learning A–Z (Python)** – Udemy

- **Deep Learning Specialization (in progress)** – Andrew Ng

- **All Certificates:**
  View
  Download

Projects

ML Research Codebase

- Public GitHub repo with implementation of custom experiments from research paper
- Notebooks, results, plots and analysis using scikit-learn + matplotlib
Link: github.com/AadityaEpic

CS50P Final Project – Text Adventure Simulator

- Fully functional Python-based command-line game
- Logic includes branching choices, state management, basic inventory/economy system - Demo Video (YouTube)

Implementation and Evaluation of ML Algorithms

- Built and tested all major machine learning models (Logistic Regression, Decision Trees, k-Nearest Neighbors, Support Vector Machines, Naive Bayes, etc.)
- Built CNNs and ANNs properly, on recognized datasets
- Applied models to real-world datasets using scikit-learn; evaluated using accuracy, precision, recall, F1-score
- Explored effects of hyperparameters and preprocessing techniques
- Developed independently alongside course-based learning for deeper understanding.

Talks and Teaching

- Scheduled school lecture on ML and research paper presentation (July 2025)
- Assisting PhD-level learners informally, created graphical abstracts for PhD-level papers, and helped with formatting and summarization.

Technical Skills

• Python   • Machine Learning   • Deep Learning   • PyTorch   • Scikit-learn   • NumPy, Pandas, Matplotlib   • LaTeX   • Google Colab, Jupyter Notebook   • Video Editing (PP, AE)   • Graphic Design (Adobe tools)

Languages

- **English:** Fluent
- **Hindi:** Fluent
- **Gujarati:** Native
- **French:** Beginner
- **German:** Beginner

Date

Last updated date: 12th July 2025