

# Ayush Bharadwaj

Data Scientist - Machine Learning, Optimization

ayusbhar2.github.io

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## SKILLS

Supervised / Unsupervised Machine Learning, Deep Learning, Ensemble Learning, Anomaly Detection, Feature Engineering, Experiment Design & Analysis | Convex / Non-convex Optimization, Network Optimization, Linear / Mixed-Integer / Quadratic / Semidefinite Programming, Metaheuristics

Languages: Python, Julia, SQL, Bash

Tools: CVXPY, Numpy, SciPy, Scikit-Learn, Pandas, Git, PostgreSQL, AWS, GCP

## EDUCATION

M.A. Mathematics | Optimization, Algebraic Geometry 2023

San Francisco State University

San Francisco, CA

M.S. Operations Research 2014

Case Western Reserve University

Cleveland, OH

B.Tech. Civil Engineering 2004

Indian Institute of Technology

Varanasi, India

## PROJECTS

Robustness Verification of Neural Networks using Optimization Methods | Python, CVXPY 2023

*Python implementation of optimization methods to verify robustness of classifier networks*

Complex Critical Points of Deep Linear Neural Networks | Julia, HomotopyContinuation.jl 2022

*Research paper exploring the loss landscape of neural networks using computational algebraic geometry*

## EXPERIENCE

Data Scientist, Risk / Fraud Detection

May 2016 – Oct 2019

Postmates (acquired by Uber) | On-demand delivery

San Francisco, CA

- As the first data scientist, bootstrapped the company's ML system for payment fraud detection.
- Trained random forests to mimic human "judgment" in the absence of ground truth.
- Introduced better error metrics for model diagnosis under very high class skew.
- Wrote the decision engine for model-informed as well as rule-based real time decisions.
- Developed data pipelines for online and offline feature generation and storage.
- Built a control-group based simulation framework to accurately measure model performance.

Risk Analyst, Consumer Risk

May 2014 – May 2016

PayPal | Fintech

San Jose, CA

- Investigated payment fraud trends by identifying anomalous events in financial transaction data.
- Optimized decision thresholds to reduce the Risk system's overall cost of misclassification.
- Researched the information value of new variables to include in machine learning models.

Data Scientist, Informatics (Intern)

Oct 2013 – Jan 2014

Explorys (acquired by IBM) | Healthcare Analytics

Cleveland, OH

- Wrote software to clean, combine and ingest data from various external sources.
- Evaluated the effectiveness of classifier algorithms via AUC-ROC analysis.

Software Engineer / Consultant

Jun 2004 – Jul 2012

Infosys Limited | Software Services

Bangalore, India

- Software development • Query optimization • Systems Integration • Incident management