Pranjal Rawat

Email: pp712@georgetown.edu, Phone: +12028554816, Github

EDUCATION

Ph.D. Economics Georgetown University, Washington DC, USA. (2021-2026)
MS Economics Madras School of Economics, Chennai, India. (2016-2018)

SKILLS

Languages: Python, R, Stata, Julia, Matlab, SAS, SQL, PySpark
Frameworks: EconML, Prophet, PyTorch, Tensorflow, Sklearn, Statsmodels
Certifications: Coursera Machine Learning and Deep Learning Specializations.

EXPERIENCE

Assistant Manager American Express 2020-2021

- Implementing Facebook's PyTorch Big Graph to match interests, merchants, and customers. Graph embeddings from this facility produced affinity scores for over 100 million merchants, 350+ interests, and 60 million card members.
- Natural Language Processing techniques to build a name and address matching algorithm. This algorithm was used to match and correct over 100k mismatches.

Business Analyst American Express 2018-2020

- Developed large-scale machine learning models (CatBoost, XGBoost) to predict the probability of conversion and engagement of customers on marketing communications. This capability produced an uplift of about 15-20% on Email and Digital channels for over 60 million US Card members.
- Built a real-time outlier detection algorithm to detect incorrect flight streaming data from upstream providers.

ONGOING PROJECTS

Model-Based Reinforcement Learning in Markets
We study algorithmic collusion in dynamic pricing games and auctions with many firms. We study how different models of the environment - predictive, causal, structural - can give rise to different optimal policies in a multi-agent setting. We test altenative market designs to see how competition can be restored.

Customer-Specific Price Sensitivities in E-commerce Platforms
We employ neural networks to directly model customer-specific price sensitivities in the demand function as a function of demographics and history. This approach is highly scalable, can parse text and images, correct for endogeneity, and be solved by automatic differentiation in PyTorch. We test this method on e-commerce data and show how it can be used for hyper-personalized pricing and offer targeting.

OTHER ACADEMIC

Fall 2022: Teaching Assistant for Financial Markets for MS Economics
Spring 2023: Teaching Assistant for Advanced Data Analysis for MS Economics
Summer 2022: Research Assistant for FinTech under Dr. Alberto Rossi
2020 Working Paper: "Inflation Targeting in the United Kingdom"

AWARDS

Winner, Machine Learning Hackathon, American Express 2018
Gold Medallist, MS Economics, Madras School of Economics 2018
Winner, Reserve Bank of India, National Policy Challenge 2017
Gold Medallist, Physics and Chemistry, Gitanjali Senior School 2012