

SHAMINDRA SHROTRIYA

Principal Data Scientist / AI Solution Architect / Researcher

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EDUCATION

Carnegie Mellon University

PhD and M.S. in Statistics

Pittsburgh, PA

Aug 2017 – Dec 2022

- **Courses:** Adv. Statistical Inference, Adv. Probability Theory, Convex Optimization, Deep Learning, Statistical Machine Learning
- **Thesis:** *On Some Problems in Nonparametric and Location-Scale Estimation.*
- **Committee:** Matey Neykov (advisor), Arun Kumar Kuchibhotla, Yang Ning, Alex Reinhart, Alessandro Rinaldo, Larry Wasserman.
- **Research Interests:** Density estimation, Bradley-Terry ranking, Isotonic regression, Causal inference, Forecasting.
- **Nominee:** Umesh K. Gavaskar Best Thesis Award
- 3.92 / 4.0 GPA.

University of California, Berkeley

M.A. in Statistics

Berkeley, CA

Aug 2015 – Dec 2016

- Elizabeth Scott Memorial Award (Research).
- Outstanding GSI Award.
- 3.90 / 4.0 GPA.

University of New South Wales

BCom in Actuarial Studies and Finance

Sydney, NSW

Mar 2003 – Jan 2007

- UNSW Co-op scholar in Actuarial Studies.
- Graduated with Distinction.

SKILLS, LANGUAGES, INTERESTS

- **Programming (Proficient):** Python, R, SQL, Unix, Version control, Make
- **Programming (Competent):** HTML, CSS, Javascript, MATLAB, SAS
- **Toolkit:** Google BigQuery, AWS Redshift, Git, Docker, JAX, Numpy, Pandas, Plotly, Pytorch, DuckDB, VertexAI, JIRA
- **Soft Skills:** Stakeholder Management, Technical Writing, Sprint Planning, Scrum Master

WORK EXPERIENCE

Walmart, Inc (Centroid Retail Intelligence)

Principal AI Solution Architect

Bentonville, AR

Apr 2024 – Present

- Built and led Walmart's 'ShelfEdge 3.0' forecasting model for automated daily accurate SKU backroom separation. The model saved an estimated 5M labor hours annually across 1500 pilot stores, and was scaled to 2700 fastunloader stores.
- Developed a novel trend calibration tool called Harmonization. Utilizing Harmonization across the Walmart supply chain sales forecasts led to a post-hoc reduction in MAPE of 4.7%, on average, across all 4700 Walmart stores (patent application in process).
- Productionized the Walmart Customer Experience Elasticity (CXE 2.0) model, spanning all 50+ retail product categories. The new end-to-end Python pipeline implementation reduced runtime down to ~2 hrs (from ~22 hrs).

Principal Data Scientist

Sep 2023 – Apr 2024

- Developed the causal modeling framework to measure the elasticity in our Customer Experience (CX) score metric, in response to varying the delivery speed promise.
- Led a collaboration with Prof. Giovanni Petris (Dept. Head of Statistics at University of Arkansas) to build hierarchical product forecasts at Walmart scale using Bayesian Dynamic Linear Models (DLMs).

Carnegie Mellon University

Co-Director (Optum Summer Bridges) & Assistant Teaching Professor

Pittsburgh, PA

Feb 2023 – Aug 2023

- Co-director of 8 week undergraduate summer research program with 30-35 students selected nationally.
- Taught daily data science lectures on advanced statistical methods using R and Python. Mentored four healthcare research projects.
- Designed and a new data engineering course focused on advanced Unix, SQL, and MLOps concepts.

freelancer.com

Team Lead, Data Science Infrastructure

Sydney, NSW

Jun 2014 – Jul 2015

- Designed and productionized the new A/B testing framework. Demonstrated the effectiveness of the framework by piloting a marketing campaign that led to 3.5% conversion rate uplift.
- Co-led the Extract-Transform-Load (ETL) implementation written in Go and AWS Redshift, serving ~15M daily active users (DAUs) distributed across 35+ countries.

Woolworths Ltd. (Quantium) <i>Lead Data Scientist</i>	Sydney, NSW Jun 2012 – Jun 2014
<ul style="list-style-type: none"> Led the end-to-end development of the ‘Behavioural Lifestage’ classifier for the entire 7m Woolworths Supermarket customer base. This is the primary targeting feature used by Woolworths for major marketing campaigns across Australia. Co-designed and developed the National Australia Bank Online Retail Sales Index (NORSI), Australia’s leading online sales indicator. 	
United Nations - International Labor Organization (ILO) <i>Microinsurance Fellow</i>	Brisbane, QLD Jun 2011 – May 2012
<ul style="list-style-type: none"> Wrote a report on the best actuarial pricing practices to be undertaken by microinsurance organisations. Selected as an ILO Microinsurance Fellow based on industry experience and academic merit. 	
PwC (PricewaterhouseCoopers) <i>Senior Actuarial Consultant</i>	Sydney, NSW Jul 2007 – May 2011
<ul style="list-style-type: none"> Conducted quarterly actuarial reserving for NSW WorkCover. At a total liability valuation of ~\$16B (AUD), this is Australias’ largest public sector Workers Compensation Scheme. 	

RESEARCH AND PUBLICATIONS

Nonparametric Estimation in the Dynamic Bradley-Terry Model. <i>AISTATS (Heejong Bong*, Wanshan Li*, Shamindra Shrotriya*, Alessandro Rinaldo)</i>	Jun 2020
Supremum-norm Bounds of the MLE in the BTL Model under General Comparison Graphs. <i>UAI (Wanshan Li*, Shamindra Shrotriya*, Alessandro Rinaldo)</i>	Jun 2022
Predictive Inference of a Wildfire Risk Pipeline in the United States. <i>NeurIPS Workshop on Tackling Climate Change with AI (Niccolo Dalmaso*, Shamindra Shrotriya*, Alex Reinhart)</i>	Dec 2019

WORKING PAPERS (UNDER REVIEW)

Revisiting Le Cam’s Equation - Exact Minimax Rates over Convex Density Classes. <i>ArXiv:2210.11436 (Shamindra Shrotriya*, Matey Neykov)</i>	Jun 2024
Adversarial Sign-Corrupted Isotonic Regression. <i>ArXiv:2210.11436 (Shamindra Shrotriya*, Matey Neykov)</i>	Dec 2023
maars: Tidy Inference under the 'Models as Approximations' Framework in R. <i>ArXiv:2106.11188 (Riccardo Fogliato*, Shamindra Shrotriya*, Arun Kumar Kuchibhotla)</i>	Jun 2023

OPEN-SOURCE SOFTWARE

maars (R implementation of 'Models as Approximations' Framework) <i>https://shamindras.github.io/maars (Riccardo Fogliato*, Shamindra Shrotriya*, Arun Kumar Kuchibhotla)</i>	Jun 2023
iterative Random Forests (iRF) <i>https://github.com/Yu-Group/iterative-Random-Forest (joint work with the Yu Group at UC Berkeley)</i>	Aug 2017

HONORS AND AWARDS

Nominee - Umesh K. Gavaskar Best Thesis Award Issued by <i>Carnegie Mellon University</i>	Pittsburgh, PA Jun 2023
Posit Scholar Issued by <i>Posit, Inc (formerly RStudio)</i>	Pittsburgh, PA Jun 2021
NGC Wildfire Research Scholar Issued by <i>American Australian Association</i>	New York, NY Jun 2020
TA of the Year Issued by <i>Carnegie Mellon University</i>	Pittsburgh, PA Jun 2020
CMSAC Best Paper Award Issued by <i>Carnegie Mellon Sports Analytics Conference (CMSAC)</i>	Pittsburgh, PA Oct 2019
Outstanding Graduate Student Instructor (GSI) Issued by <i>University of California, Berkeley</i>	Berkeley, CA Mar 2017
Elizabeth Scott Memorial Award (Research) Issued by <i>University of California, Berkeley</i>	Berkeley, CA Oct 2016