Rob Donnelly rndonnelly@gmail.com 240-241-1447

Education

Stanford Graduate School of Business, *PhD in Economics* **2014–2019**

Coursework: Artificial Intelligence, Machine Learning, Machine Learning for Causal Inference, Convex Optimization, Modern Applied Statistics, Bayesian Statistics, Econometrics, CS106X

Teaching:

Data and Decisions (MBA statistics using R): Teaching assistant in flipped classroom setting.

Big Data, Strategic Decisions (Executive MBA course): Co-created two new "data science" case studies

Data/Software Carpentry: Two-day teacher training program for data and research computing skills

Pomona College, *BA in Mathematics, minor in Economics* **2009**

Employment

Facebook / Novi Financial, Economics Research Scientist **2019-present**

Worked on a wide variety of empirical, strategic, and financial related to the design and operation of the Libra payments network. Analyzed pricing and competition in remittance market. Combined pricing and transaction data from existing stablecoins to calibrate simulations of coin liquidity on Libra network.

Microsoft Research, Summer Intern **2017**

Analyzed potential applications and extensions of "Deep IV" model for automated causal inference.

Microsoft Research, Economics Research Assistant **2012–2014**

Estimated theory-based empirical model of advertiser behavior in online search ad auctions to infer advertiser preferences and predict their responses to changes in the platform.

Analyzed the effects of search result quality on user behavior using causal random forests.

Cornerstone Research, Senior Analyst **2009–2012**

Carried out economics and financial analyses to supported expert witnesses in corporate litigation.

Research

A Unified Framework for Personalizing Product Rankings

In progress with Ilya Morozov and Ayush Kanodia

Created latent-factorization-based model to learn customer preferences by combining ranking, click, and purchase data in PyTorch. Applied model to data from Wayfair.com to understand impact of personalized search rankings on consumer welfare, Wayfair revenue, and effect on "long tail" products.

Estimating Heterogeneous Consumer Preferences for Restaurants and Travel Time

Published in AER P&P 2018 with Susan Athey, David Blei, Francisco Ruiz, and Tobias Schmidt

Estimated individual-specific consumer preferences for restaurants using Yelp.com data combined with detailed geospatial tracking data. Predicted patterns of spatial competition in a dense urban region with thousands of consumers and restaurants. Used variational Bayesian approach for scalable inference.

Counterfactual Inference for Consumer Choice with Many Products

with Susan Athey, David Blei, and Francisco Ruiz

Compared the ability of econometric and machine learning based models to accurately predict out-of-sample responses to price changes and stockouts in a grocery store. Demonstrated the effectiveness, speed, and interpretability of latent-factorization-based models. Evaluated the potential gains from using flexible models to target personalized marketing and pricing campaigns.

Computer Skills

R, SQL, Python, PyTorch, Scope/Cosmos (Microsoft analogue to Hadoop)