Nathaniel Burbank

nathaniel.burbank@gmail.com 941-962-6660 Washington, DC, 20003

Experience

Wayfair Washington, DC (Remote)
Data Scientist III, Profitability Algorithms *09/20-8/22*
Data Science lead on damage and return rate forecasting models used for outlier detection and profit-aware sort.

- Proposed, prototyped, and productionized new incident-rate outlier model. Deployed this model to save Wayfair an estimated $60 million annually in damage and return costs via automated early detection of products with anomalously high incident rates.
- Combined gradient boosted trees (LightGBM) and Bayesian probabilistic modeling to predict future damage-rate outliers within groups of substitutable products, accounting for data sparsity.
- Fit Weibull survival model of damage and return landing curves enabling earlier detection of incident rate spikes.
- Scaled system from an MVP prototype to a global, fully automated data and modeling pipeline of docker containers orchestrated by Apache Airflow on Google Cloud.
- Led director-level meetings with stakeholders to strengthen business buy-in and expand use of the model.
- Mentored junior data scientists and provided detailed feedback on design documents and pull requests.
- Managed projects' data science and engineering roadmaps.

Data Scientist II, Central Algorithms *05/18-08/20*
Developed new models and randomized experiments to measure key operational coefficients.

- Designed and deployed six-week experiment to measure product-level demand lifts and cross-product substitution resulting from increasing shipping speed. Test enabled downstream teams to optimize product pre-positioning and informed executive decision-making on over $100 million of investments in warehouses.
- Developed granular estimates using a customized Causal Forest model (combining random forests and causal estimation).
- Created custom experiment tracking datamart in Apache Hive that aggregated daily customer-product interactions into tractable aggregates.
- Advised two teams of Harvard graduate students as they predicted Wayfair operational outcomes with NLP features.

Harvard University Boston, MA
Graduate Teaching Fellow, Introduction to Data Science (CS 109) *08/17-12/17*
Held office hours, developed lesson plans, and taught weekly recitation to 25+ students.

U.S. Census Bureau Suitland, MD
Graduate Civic Data Science Fellow, Center for Big Data Research and Applications *06/17-08/17*
Developed new methods to improve automated industry classification of business establishments.

- Developed a random forest model to match names and addresses between datasets lacking a shared identifier with high accuracy.
- Built ensemble classifier using only external data that correctly assigned NAICS classifications to business units with high probability. Prototype exceeded existing benchmarks and demonstrated viability of automated alternatives to costly internal data collection process.

Harvard Business School Boston, MA
Research Associate *06/12-06/16*
Head case writer and simulation developer for economists Josh Lerner and Matthew Rhodes-Kropf.

- Developed probabilistic investment models for in-depth Venture Capital and Private Equity market simulation.
- Coauthored more than a dozen private equity-focused HBS cases and teaching notes used in business schools worldwide.

Education

Harvard University Cambridge, MA
Master of Science, Computational Science and Engineering *08/16-03/18*
New College of Florida Sarasota, FL
Bachelor of Arts, Political Science/International and Area Studies *08/01-05/05*

Skills

Languages: Python, SQL, Stan, R, C **Technologies**: Pandas, PySpark, GCP, PyStan, Airflow, Hive