JULIANNA HARWOOD

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Professional Experience

Data Scientist, *Los Angeles Times,* Los Angeles CA *July 2023 - Present*

- Analyze data from AB tests and write results memos to inform product decisions and roadmaps. Account for multiple testing adjustments, troubleshoot SRM issues and perform other validation checks on data to ensure results are reliable.
- Apply causal inference methods such as difference in difference and regression discontinuity to time series data from un-controlled feature launches to understand the causal relationships between features and KPIs.
- Led the refinement and expansion of the business's LTV prediction model by standardizing performance testing of the base Cox proportional hazards regression model and expanding use cases to achieve less than 5% error in average annual LTV per subscriber. Re-architected pipeline and built RShiny app to make inference self-serve for product stakeholders.
- Implemented platform that automates results visualization, audience segmentation and dimensional analysis to reduce workload of data scientists for AB tests from weeks to hours and double testing velocity YoY.

Consultant, *Accenture (advanced application engineering practice)*, Los Angeles CA *August 2019 – June 2022*

- Truck Routing Application
    - Created and implemented a mixed integer model to optimize delivery truck routes using annealing algorithms.
    - Performed parameter tuning through grid searches to achieve valid solutions for problems 10x larger than those of previous attempts using similar approaches.
- Portfolio Optimization Application
    - Co-authored optimization model to reduce transaction costs of financial portfolios; submitted for patent.
    - Led the integration of the model into a web app using AWS services to achieve one of the first demonstrations of Amazon Braket, AWS's quantum computing service.
- AI Enterprise Search Engine
    - Scripted automated tests with Pytest to evaluate performance of custom-made, BERT-based, conversational Q&A platform, hosted on AWS.
    - Routinely summarized and communicated results to product owner and lead developer to facilitate informed decision making around iterations and improvements.

Data Analyst*, Cogo Labs,* Cambridge MA *June – August 2018*

- Analyzed web traffic data using SQL to develop plans for online happy-hour-finder that reached 11,000 visits in seven weeks.
- Designed and conducted AB tests to evaluate website features and ad strategies against KPIs such as daily unique visitors, bounce rates and cost per click of ads.
- Developed dashboards from SQL workflows to provide accessible and up to date visibility into KPIs.
- Built a messaging bot using Python and SQL that alerts users to long running and long-standing SQL executions and deliveries to minimize data storage costs for the company.

Education

Wesleyan University, Middletown CT *May 2019*

Bachelor of Arts, Major: Physics, Economics; Minor: Data Analysis; Phi Beta Kappa

Skills

Programming Expertise: R, SQL (Snowflake), Python

Technical Expertise: machine learning, causal inference, ab testing, survival analysis, AWS ecosystem

Research Assistant, *Wesleyan University,* Middletown CT *June 2017 – May 2018*

Physics Department, Advisor: Candice Etson, PhD

- Developed methods and a system of KPIs to quantify learning in first year physics classes.
- Designed and conducted controlled experiments to assess statistically significant differences in material retention across a variety of course structures.
- Synthesized and presented findings to the physics department to support improvement of student experiences in classes.

Analytical Projects

Quantitative Analysis Center, Wesleyan University *January – May 2019*

- Designed and completed a research project to analyze data from U.S. News and World Report to explore different grouping of American colleges and universities.
- Preprocessed and cleaned data, performed univariate and bivariate analysis, tested different methods of factor analysis and clustering, and wrote report including finalized analysis and visualizations; written in R.

Quantitative Analysis Center, Wesleyan University *September – December 2018*

- Designed and completed a research project using machine learning techniques to predict how likely a given gun violence incident is to have one or more casualties.
- Cleaned data, performed extensive feature engineering and created a series of classifiers using Naïve Bayes, Random Forest, Support Vector Machine and Neural Networks; written in R.

MODEL	STINT_AGE	LTV_ERROR	SURVIVAL_ERROR
annual_model	52	3.79%	3.75%
annual_model	104	-11.18%	-37.97%
annual_model_resub	52	3.79%	3.75%
annual_model_resub	104	-11.15%	-37.74%
non_annual_model	52	1.79%	-10.35%
non_annual_model	104	-9.16%	-16.06%
non_annual_model_resub	52	1.58%	-10.57%
non_annual_model_resub	104	-9.11%	-16.00%

Offer 2 (LAT): Start rate of $0.04/week for 26 weeks. Source: MD - Modal Sale

STINT_AGE_yrs	prob_of_retention	estimated_LTV	estimated_LTV_lower	estimated_LTV_upper
1	0.28	42.40	42.12	42.68
2	0.08	73.55	72.84	74.27
3	0.01	81.72	80.80	82.63

Summary Plots

Offer 1 (LAT): Start rate of $0.25/week for 16 weeks. Source: MD - Modal Sale
Offer 2 (LAT): Start rate of $0.04/week for 26 weeks. Source: MD - Modal Sale