

Wayne Wang, PhD

email: wwang0328@gmail.com

cell: 734.277.5499

web: ywa136.github.io

SUMMARY

Data scientist and applied researcher with a PhD in Statistics and 6+ years of experience in statistics and machine learning. A wide spectrum of expertise in experimental design, causal inference, high-dimensional/spatio-temporal data analysis, optimization. Proven ability to apply analytical methods to solve practical product problems with measurable impact, develop innovative data-driven solutions at scale, and communicate complex technical concepts to a variety of audiences (e.g., Product Managers, Engineers, Researchers, etc) in cross-functional projects.

TECHNICAL SKILLS

- **General Programming:** R, Julia, Python, MATLAB
- **Data Engineering:** SQL, BigQuery, Spark/Hadoop, Dataflow
- **Data Visualization:** R (tidyverse, dplyr, ggplot2, shiny), Python (bowtie, seaborn, plotly), Looker
- **Machine Learning Framework:** TensorFlow/TFX, scikit-learn.
- **Cloud & Distributed Tool:** GCP, MPI, Git, Mercurial.

PROFESSIONAL EXPERIENCE

- **Google, Data Scientist** *Jul '22 - present*
 - **Running and Analyzing Large-scale Online Experiments:** Designing A/B tests for YouTube Ads relevance measurement; defining user-centric metrics using online surveys and utilizing causal inference methods to drive statistically significant effects of ads relevance improvement; implementing scalable solutions to reduce bias in online surveys; optimally mapping users' sentiments to numerical scores via Bayesian optimization. *Tools: R, GoogleSQL* (⚡Constructed metrics focused on ads relevance and successfully landed as secondary **launch metrics** for YouTube Ads overall marketplace optimization).
 - **Developing Model-based Measurement Framework:** Developing and productionizing machine learning models (e.g., DNNs, Decision Forests) for measuring and optimizing users' perceived relevance towards ads. *Tools: R, Python, GoogleSQL* (⚡Increased metric sensitivity in A/B experiments by **2x to 12x**, effectively saved the team from having to increase the survey load by at least **4x**, which amounts to roughly **53 million** ads slot saved at minimum; Developed associated internal **R packages** for general model-based metric construction).
 - **Designing and Analyzing Human Evals:** Designing human evaluation templates and guidelines for ads contextual relevance. Implementing statistical models (e.g., mixed-effects models, krippendorff's alpha) for measuring and improving rater agreement and accuracy of the evals. *Tools: R, GoogleSQL* (⚡Revamped evaluation templates and measurement techniques have boosted the agreement among human raters by more than **3X**, **effectively reducing** evaluation cost and the noise of the ratings subsequently used in machine learning model training).
- **Los Alamos National Laboratory, Research Intern** *May '21 - Aug '21*
 - **Streaming Distributed PCA for Exascale Climate and Space Sciences:** Designed an communication-efficient streaming & distributed PCA algorithm for online analysis and visualization of exascale data generated from climate and space weather simulations. *Tools: Julia, MapReduce, MPI* (⚡Paper published at ACM/IEEE Supercomputing Conference '21; Developed an associated open-source Julia package called **TributaryPCA**).

RESEARCH EXPERIENCE

6+ years of research experience in statistics, machine learning, and optimization, with broad applications in text & image analysis and space & climate science. 10+ peer-reviewed publications in top statistical journals and machine learning conferences with 60 citations (⚡Google Scholar page). Selected research projects include:

- **High-dimensional Gaussian Graphical Models for Tensor-Variate Data:** Proposed a novel physics-driven generative model for high-dimensional multiway/tensor-variate data. Designed efficient optimization algorithms for learning the underlying statistical model. *Tools: Julia* (⚡Papers published at AISTATS '20, ICML '21, NeurIPS '21, and Statistics Surveys; Developed an open-source Julia package called **TensorGraphicalModels**).
- **Time-Varying Topic Models:** Developed a framework for topic modeling of time-varying corpora, combining statistical models with computational geometric methods. *Tools: Python, Spark, Hadoop* (⚡Paper published in Harvard Data Science Review; Developed an online exploratory analysis/visualization tool using **R Shiny**).
- **Deep Learning for Solar Flare Forecasting:** Proposed an ensemble method combining LSTM and CNN for classification of flare-imminent active regions using video data. *Tools: Python* (⚡Paper in The Astrophysical Journal).

EDUCATION

- **University of Michigan** Ann Arbor, MI
 - Ph.D. in Statistics* *Sep '18 - Jul '22*
 - Dissertation: Interpretable and Scalable Graphical Models for Complex Spatio-temporal Processes
- **University of British Columbia** Vancouver, Canada
 - M.S. in Statistics* *Sep '16 - Aug '18*
- **Simon Fraser University** Vancouver, Canada
 - B.S. with Distinction in Actuarial Science (Completed SOA Exams P, FM, and MFE)* *Sep '12 - May '16*