Yuki Ohnishi

yohnishi@purdue.edu
(765) 400-6824
242 S.Salisbury St. Apt. 7, West Lafayette, IN
https://yukiohnishi.github.io

RESEARCH INTERESTS

Causal Inference, Bayesian Analysis, Bayesian Nonparametrics, Decision Theory, Differential Privacy, Statistical Learning Theory, Machine Learning, Clinical Trials, Digital Marketing

EDUCATION

Purdue University — West Lafayette, IN, USA
PhD in Statistics — Sep 2018 - Aug 2024 (expected)
Advisors: Jordan Awan and Arman Sabbaghi

The University of Tokyo — Tokyo, Japan
Master in Industrial Engineering, Operations Research — Apr 2011 - Mar 2014

The University of Tokyo — Tokyo, Japan
Bachelor in Industrial Engineering, Operations Research — Apr 2007 - Mar 2011

PROFESSIONAL CAREER

Purdue University — West Lafayette, IN, USA
Research Assistant — Aug 2020 - present

- Developed a causal inferential methodology for complicated experimental settings with interference, treatment noncompliance, and missing outcomes. An efficient Bayesian nonparametric algorithm is implemented in Julia.
- Developed causal inferential methodologies for differentially privatized data.
- Developed a causal inference methodology for observational studies involving sequential treatments, accounting for latent confounders and noncompliance.
- Calibrated prediction of conversion rates for sequential digital marketing promotions, with valid uncertainty quantification using ML/deep learning.

Purdue University — West Lafayette, IN, USA
Teaching Assistant — Sep 2018 - Aug 2020

- Led lab sessions and prepared course materials for introductory statistics courses for undergraduate students from areas of mathematical sciences, engineering, and physical sciences.
- Provided help on various technologies for undergraduate students from a data science-oriented learning community.
- Held office hours and graded homework for graduate-level courses.

Boehringer Ingelheim — Ridgefield, CT, USA
Data Scientist Summer Intern — May 2023 - Aug 2023

- Developed a meta-analysis tool for Bayesian historical borrowing in clinical trials using R and Rstan.
- Designed and conducted simulation studies to assess the efficacy of our meta-analysis tools for correlated bivariate endpoints in the HPC environment (SLURM).

Visional, Inc. — Tokyo, Japan
Data Scientist — May 2015 – Aug 2018

- Improved job-search recommender system efficiency by 25%, developing ETL pipelines and ML models, and using CPLEX for optimization.
- Enhanced marketing outcomes, boosting CTR by 15% and CVR by 10% through attribution and lifetime value models, and optimizing ad budgets.
- Conducted A/B testing with Multi-armed Bandit experiments to evaluate algorithms.
- Regularly utilized SQL for KPI dashboard visualization in Tableau.
- Implemented Bayesian hierarchical modeling for user retention and talent management, presenting findings at KDD and INFORMS conferences.

HONORS and AWARDS

College of Science Graduate Student Travel Award, Purdue University, 2023.

Research Assistantship, 2020.

ON-GOING PROJECTS

1. **Y. Ohnishi** and J. Awan. "Locally Private Causal Inference for Observation Studies.

SUBMITTED PAPERS

1. **Y. Ohnishi**, B. Karmakar and A. Sabbaghi. "Degree of Interference: A General Framework for Causal Inference under Interference," Submitted to *Biometrika*, Link.
2. **Y. Ohnishi**, B. Karmakar and W. Kar. "Inferring Causal Effect of a Digital Communication Strategy under a Latent Sequential Ignorability Assumption and Treatment Noncompliance," Submitted to Journal of the American Statistical Association.
3. **Y. Ohnishi** and J. Awan. "Locally Private Causal Inference for Randomized Experiments," Submitted to Journal of Machine Learning Research. Link.

REFEREED PUBLICATIONS

1. **Y. Ohnishi** and A. Sabbaghi. 2022. "A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes," *Bayesian Analysis*, 1–30. Link.
2. **Y. Ohnishi** and J. Honorio. 2021. "Novel change of measure inequalities with applications to PAC-Bayesian bounds and Monte Carlo estimation," *International Conference on Artificial Intelligence and Statistics*, 1711-1719. Link.

NON-REFEREED PUBLICATIONS

1. **Y. Ohnishi** and S. Sugaya. 2019. "Applying Bayesian Hierarchical Probit Model to Interview Grade" Evaluation. KDD'19, International Workshop on Talent and Management Computing. Link.
2. **Y. Ohnishi** and S. Sugaya. 2018. "Bayesian Hierarchical Bernoulli-Weibull Mixture Model for Extremely Rare Events." INFORMS Business Analytics Conference. Link.

PRESENTATIONS

Y. Ohnishi. 2023. A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes. International Conference on Design of Experiments (ICODOE 2023). The University of Memphis, Memphis, TN.

Y. Ohnishi and Sabbaghi, A. 2022. A Bayesian Analysis of Two-Stage Randomized Experiments in the Presence of Interference, Treatment Nonadherence, and Missing Outcomes. INFORMS Workshop on Quality, Statistics, and Reliability. Indianapolis, IN.

Y. Ohnishi. 2019. Applying Bayesian Hierarchical Probit Model to Interview Grade Evaluation. KDD'19 International Workshop on Talent and Management Computing, Anchorage, AK.

POSTERS

Y. Ohnishi. 2023. Locally Private Causal Inference. Midwest Machine Learning Symposium (MMLS 2023), Chicago, IL.

Y. Ohnishi. 2021. Novel Change of Measure Inequalities with Applications to PAC-Bayesian Bounds and Monte Carlo Estimation. The 24th International Conference on Artificial Intelligence and Statistics (AISTAT 2021), Virtual.

Y. Ohnishi. 2018. Bayesian Hierarchical Bernoulli-Weibull Mixture Model for Extremely Rare Events. INFORMS Business Analytics Conference, Baltimore, MD.

TEACHING EXPERIENCES

STAT 598 Differential Privacy, Teaching Assistant	Fall 2022
STAT 538 Probability Theory I, Teaching Assistant	Spring 2021
STAT 539 Probability Theory II, Teaching Assistant	Fall 2021

STAT 350 Introduction to Statistics, Teaching Assistant	Spring 2020 - Fall 2021
STAT 190 Topics in Statistics for Undergraduates, Teaching Assistant	Fall 2018 - Fall 2020
STAT 113 Statistics and Society, Teaching Assistant	Fall 2018 - Fall 2020

ACEDEMIC SERVICES

Reviewers: Journal of Applied Statistics

SKILLS

Java, Julia, Python, R, Pandas, NumPy, SciPy, SQL, PySpark, Stan, Scikit-learn, LightGBM, XGBoost, PyTorch, Matplotlib, Seaborn, Tableau, GCP, Linux/Unix, Git