Tatsuhiro **Shimizu**

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Education

Yale University, New Haven, CT, U.S.

Yale-Visiting International Student Program, GPA 3.95/4.00, August 2022-May 2023

- Coursework: Advanced Causal Inference, Reinforcement Learning, Natural Language Processing, Probabilistic Machine Learning, Vector analysis and Integration on Manifold, Data Structures, Discrete Math, Differential Equations

Waseda University, Shinjuku, Tokyo, Japan

B.A., Major Economics, Minor Software Engineering, GPA 3.96/4.00 (Top 1/863), Expected Graduation March 2024

- Undergraduate Member of Micro-econometrics and Deep Learning Studies Seminar
- Awards: The Glory of Waseda Scholarship, Okuma Memorial Scholarship, Dean's Scholar
- Coursework: Logic, Linear Algebra, Multivariable Calculus, Math for Data Science, Game Theory, Statistics, Data Science in Economics, Causal Inference, Machine Learning, Deep Learning, C/C++, Networking Technology, Database

Work Experience

Hanjuku-Kaso, Shibuya, Tokyo, Japan, July 2023-Present

Machine Learning and Causal Inference Research Intern

- Reformulated Off-Policy Evaluation (OPE) and Off-Policy Learning (OPL) in the contextual bandits with non-stationarity
- Proposed the new estimator, which can effectively select the estimation strategy

CyberAgent AI Lab, Shibuya, Tokyo, Japan, June 2023-Present

Artificial Intelligence Research Intern

- Proved the unbiasedness, bias, and variance of a new estimator under realistic assumptions that outperforms existing estimators
- Wrote the paper for all parts, including main texts and appendices, except for the experiments part

XCat, Minato-ku, Tokyo, Japan, August 2022

Data Scientist Hackathon-type Intern

- Ranked the 2nd best place out of 12 groups by myself in the Data Science Hackathon, where almost all participants except for me were graduate students
- Analyzed the effect of telework on the productivity of the workers by using both Difference-in-Difference (DID) and Synthetic Control Method by R (synth library) and Python
- Presented the result of the causal inference research by using data visualization with Matplotlib

Waseda University, Shinjuku-ku, Tokyo, Japan, August 2022

Teaching Assistant, Causal Inference class, Masahiro Yoshida

- Created four presentation slides on RCT, DID, Regression Discontinuity Design, and a midterm exam

ADK Marketing Solutions, Minato-ku, Tokyo, Japan, September 2021

Data Analyst Intern, Data Solution Unit, Integrated Channel Strategy Center

- Analyzed the market and competitors of selected chain stores using data from a comprehensive consumer survey on the lifestyle, consumer behavior, and media exposure by using factor analysis, R
- Narrowed down advertising target based on the characteristics of the selected chain stores and the differences in customer awareness
- Proposed effective advertising methods for the target audience to increase the number of customers

Mynavi, Chiyoda-ku, Tokyo, Japan, August 2021

Soft Engineer Hackathon-type Intern
- Developed a web application with a group of four people by using HTML, CSS, Javascript, Typescript, and React as frontend programming languages
- Used Firebase for the database and GitHub for source code management

Publications

- Tatsuhiro Shimizu and Laura Forastiere. *Doubly Robust Estimator for Off-Policy Evaluation with Large Action Spaces.* in Proceedings of the 2023 IEEE Symposium Series on Computational Intelligence, in press. arXiv:2308.03443 [stat.ML]. https://arxiv.org/abs/2308.03443

- Tatsuhiro Shimizu. *Diffusion Model in Causal Inference with Unmeasured Confounders.* in Proceedings of the 2023 IEEE Symposium Series on Computational Intelligence, in press. arXiv:2308.03669 [cs.LG]. https://arxiv.org/abs/2308.03669

Working Papers

- Tatsuhiro Shimizu, Koichi Tanaka, Haruka Kiyohara, Masahiro Nomura, and Yuta Saito. *Off-Policy Evaluation for High Dimensional Actions.*

- Tatsuhiro Shimizu, Yuta Saito, and Sony AI research members. *Off-Policy Evaluation and Learning under Time-Series Non-Stationarity.*

* The orders of the author have not yet been decided

Certifications

Japan Statistical Society Certificate Grade Pre-1 pass with credit, Japan Statistical Society, June 2022

Skills

Causal Inference
- Analysis of Covariance
- Propensity Score Matching and Inverse Probability Weighting (MatchIt, lmtest and sandwich in R)
- Instrumental Variable, Non-compliance, Principal Stratification (AER in R)
- Sharp and Fuzzy Regression Discontinuity Design (rdrobust in R)
- Difference in Difference and Synthetic Control Method (synth in R)
- Mediation Analysis
- Interference (Spillover effect) (inferference in R)
- Structural Causal Model

Machine Learning
- Reinforcement Learning (Value Iteration, Linear Programming, Policy Iteration, Soft Policy Iteration, Policy Gradient, Generative Model, Offline & Online setting, Multi-agent RL, and Pessimistic Value Iteration in OPL)
- Natural Language Processing (RNN, LSTM, Transformer, GPT1, GPT2, ELMO, ULMfit, BERT, RoBERT, ALBERT, ELECTRA, BART, GPT3, T5, In-Context Learning, and zero/few shot learning)
- Generative Model (Laplace, Variational Inference, Expectation Propagation, Gibbs Sampling, Rejection Sampling, MRW, MALA, OU process, ULA, Proximal Sampler, DDPM, DDIM)

Programming
- Python (Machine Learning and Scraping by Selenium and Beautiful Soup)
- R (Statistical Testing and Causal Inference)
- Perl (Scraping)
- C & C++ (Data Structures)
- HTML, CSS, JavaScript, MySQL, Git, Docker

Mathematics
- Linear Algebra, Calculus, and Ordinary and Partial Differential Equation
- Vector Analysis, Fourier Analysis, Integration on Manifold, Complex Function, and Discrete Mathematics