Tatsuhiro Shimizu

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Education

Yale University New Haven, CT
Yale-Visiting International Student Program *August 2022–May 2023*

- GPA: 3.95/4.00
- Relevant Coursework: Causal Inference, Machine Learning, Natural Language Processing, Reinforcement Learning, Vector Analysis, Integration on Manifolds, Discrete Mathematics, Differential Equations & Data Structures

Waseda University Shinjuku, Tokyo, Japan
Bachelor of Arts in Economics *April 2020–March 2024*

- GPA: 3.96/4.00
- Relevant Coursework: Causal Inference, Machine Learning, Linear Algebra, Multivariable Analysis, Database, Logic, Statistics, Data Science, Game Theory, Networking Technology & C/C++ Programming

Research & Work Experience

Hanjuku Kaso Shibuya, Tokyo, Japan
Machine Learning Research Intern *June 2023–August 2024*

- Authored a paper on an adaptive estimator for non-stationary off-policy evaluation (OPE) and an algorithm for non-stationary off-policy learning (OPL) in collaboration with Sony
- Proposed a data-driven algorithm that maximizes the performance of a policy under the distributional shift of state and reward
- Proved the unbiasedness, bias, and variance of the proposed estimator for OPE and the one used in the proposed algorithm for OPL
- Demonstrated the substantial performance improvement of the proposed estimator with synthetic and real data in Python

CyberAgent AI Lab Shibuya, Tokyo, Japan
Machine Learning Research Intern *June 2023–August 2024*

- Authored a paper on an estimator for off-policy evaluation with high-dimensional action spaces
- Proved bias and variance of the proposed estimator under more realistic assumptions than existing ones

Yale University New Haven, CT
Research Project at Probabilistic Machine Learning Class *January 2023–May 2023*

- First-authored Backdoor criterion-based Diffusion-based Causal Model (BDCM), an extended diffusion-based causal model to answer interventional queries under the existence of unmeasured confounders published in the 2023 IEEE Symposium Series on Computational Intelligence
- Demonstrated the performance improvement of BDCM against the Diffusion-based Causal Model (DCM), an existing algorithm under the existence of unobserved confounders in Python

Research Project at Advanced Topics in Causal Inference Methods Class *January 2023–May 2023*

- First-authored Marginalized Doubly Robust (MDR), an estimator for off-policy evaluation with large action spaces published in the 2023 IEEE Symposium Series on Computational Intelligence
- Proved unbiasedness of the proposed estimator under weaker assumptions than Marginalized Inverse Propensity Scoring (MIPS) and variance reduction against the Doubly Robust (DR) estimator
- Demonstrated the supremacy of MDR against existing estimators through a synthetic data experiment in Python

XCat Minato, Tokyo, Japan
Data Science Intern *August 2022*

- Achieved the 2nd best prize out of 12 groups in the Data Science Hackathon, where approximately 90% of the participants were graduate students
- Analyzed the effect of the introduction of remote work on the productivity of the employees by using Difference-in-Difference (DID) and Synthetic Control Method (SCM) in R and Python

Waseda University Shinjuku, Tokyo, Japan
Causal Inference Teaching Assistant *August 2022*

- Created four presentation slides on Randomized Controlled Trial (RCT), DID, Regression Discontinuity Design (RDD), and a midterm exam

ADK Marketing Solutions Minato, Tokyo, Japan
Data Analyst Intern *September 2021*

- Analyzed the market and competitors of selected chain stores using data from a comprehensive consumer survey by factor analysis in 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, Tokyo, Japan
Software Engineer Intern *August 2021*

- Developed a web application with a group of four interns by using HTML, CSS, Javascript, Typescript, and React for front-end programming languages and Firebase for the database system

Publications

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

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

Working Papers

[1] Shimizu, T., Tanaka, K., Kiyohara, H., Nomura, M., and Saito, Y. Off-Policy Evaluation for High Dimensional Actions. We will submit it to *the 2024 International Conference on Machine Learning **(ICML)***. †

[2] Shimizu, T., Saito, Y., and Sony AI research members. Off-Policy Evaluation and Learning under Time-Series Non-Stationarity. We will submit it to *the 2024 International Conference on Machine Learning **(ICML)***. †

† The orders of the authors have not yet been decided

Honors & Awards

Okuma Memorial Scholarship, *Waseda University* *July 2023*

- Ranked top 1 of approximately 863 students in terms of GPA at the School of Political Science and Economics at Waseda University in 2023

End of Term Report, *Yale University* *May 2023*

- Exceptional work at the graduate seminar: Advanced Topics in Causal Inference Methods

Okuma Memorial Scholarship, *Waseda University* *July 2022*

- Ranked top 1 of approximately 863 students in terms of GPA at the School of Political Science and Economics at Waseda University in 2022

Dean's Scholars Award, *School of Political Science and Economics, Waseda University* *March 2022*

- Ranked top 1 of approximately 863 students in terms of GPA at the School of Political Science and Economics at Waseda University in 2022

The Glory of Waseda Scholarship, *Waseda University* *September 2021*

- Scholarship for studying abroad program at Yale University

Grants

IEEE CIS Conference Travel Grant, *IEEE Computational Intelligence Society* *October 2023*

- Travel grant for the 2023 IEEE Symposium Series on Computational Intelligence

Overseas Research Travel Grant Program, *Waseda University* *October 2023*

- Travel grant for the 2023 IEEE Symposium Series on Computational Intelligence

Professional Services

Conferences Reviewing

- 2023 IEEE Symposium Series on Computational Intelligence

Certifications

Japan Statistical Society Certificate Grade Pre-1 pass with credit *March 2022*

- Passed the second most difficult (3rd and 4th-year level) statistics exam (pass rate around 20%) in Japan with exceptionally high scores.

AtCoder Brown Coder, *AtCoder* *May 2021*

- Achieved a brown coder (according to the president of AtCoder, this level is excellent for undergraduates and is in the top 1–2% on other companies' job sites) by C++.

Membership

IEEE *September 2023–August 2024*

IEEE Computational Intelligence Society *September 2023–August 2024*

Languages

Japanese (native)
English (IELTS Academic Overall 7.5)