Yuta Saito

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Research Interests

My research lies at the intersection of statistical machine learning and causal inference called *counterfactual learning*. I am interested in the counterfactual nature of logged bandit feedback obtained from interactive systems, and ways of using biased real-world data to achieve safe automated decision making in the wild.

Education

2021 -   **Cornell University**
Ph.D. Student in Computer Science
Research Field: Counterfactual Evaluation and Learning, Fairness in Ranking

2016 -
2021   **Tokyo Institute of Technology**
B.Eng. in Industrial Engineering and Economics
Research Field: Counterfactual Inference, Off-Policy Evaluation, Information Retrieval

Publications

International Conference Proceedings (refereed)

1. **Yuta Saito** and Thorsten Joachims. Fair Ranking as Fair Division: Impact-Based Individual Fairness in Ranking. In *Proceedings of the 28th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2022.

2. **Yuta Saito** and Thorsten Joachims. Off-Policy Evaluation for Large Action Spaces via Embeddings. In *Proceedings of 39th International Conference on Machine Learning (ICML)*, 2022.

3. **Yuta Saito** and Masahiro Nomura. Towards Resolving Propensity Contradiction in Offline Recommender Learning. In *Proceedings of the 31st International Joint Conference on Artificial Intelligence (IJCAI)*, 2022 (to appear, **Long Talk**).

4. Haruka Kiyohara, **Yuta Saito**, Tatsuya Matsuhiro, Yusuke Narita, Nobuyuki Shimizu, and Yasuo Yamamoto. Doubly Robust Off-Policy Evaluation for Ranking Policies under the Cascade Behavior Model. In *Proceedings of International Conference on Web Search and Data Mining (WSDM)*, 2022 (**Best Paper Runner-Up Award**).

5. Daisuke Moriwaki, Yuta Hayakawa, Isshu Munemasa, **Yuta Saito**, and Akira Matsui. A Real-World Implementation of Unbiased Lift-based Bidding System. In *Proceedings of the 2021 IEEE International Conference on Big Data (BigData)*, 2021.

6. **Yuta Saito**, Shunsuke Aihara, Megumi Matsutani, and Yusuke Narita. Open Bandit Dataset and Pipeline: Towards Realistic and Reproducible Off-Policy Evaluation. In *Proceedings of the Neural Information Processing Systems (NeurIPS) Track on Datasets and Benchmarks*, 2021.

7. Masahiro Nomura* and **Yuta Saito*** (*equal contribution). Efficient Hyperparameter Optimization under Multi-Source Covariate Shift. In *Proceedings of the 30th ACM International Conference on Information and Knowledge Management (CIKM)*, 2021.

8. **Yuta Saito***, Takuma Udagawa*, Haruka Kiyohara, Kazuki Mogi, Yusuke Narita, and Kei Tateno (*equal contribution). Evaluating the Robustness of Off-Policy Evaluation. In *Proceedings of the 15th ACM Conference on Recommender Systems (RecSys)*, 2021.

9. Nathan Kallus, **Yuta Saito**, and Masatoshi Uehara. Optimal Off-Policy Evaluation from Multiple Logging Policies. In *Proceedings of 38th International Conference on Machine Learning (ICML)*, 2021.

10. **Yuta Saito**. Doubly Robust Estimator for Ranking Metrics with Post-Click Conversions. In *Proceedings of the 14th ACM Conference on Recommender Systems (RecSys)*, 2020.

11. **Yuta Saito**. Unbiased Pairwise Learning from Biased Implicit Feedback. In *Proceedings of 6th ACM SIGIR International Conference on the Theory of Information Retrieval (ICTIR)*, 2020.

12. **Yuta Saito** and Shota Yasui. Counterfactual Cross-Validation: Stable Model Selection Procedure for Causal Inference Models. In *Proceedings of 37th International Conference on Machine Learning (ICML)*, 2020.

13. **Yuta Saito**. Asymmetric Tri-training for Debiasing Missing-Not-At-Random Explicit Feedback. In *Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2020.

14. **Yuta Saito**, Gota Morishita, and Shota Yasui. Dual Learning Algorithm for Delayed Conversions. In *Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2020 (short paper).

15. **Yuta Saito**, Hayato Sakata, and Kazuhide Nakata. Cost-Effective and Stable Policy Optimization Algorithm for Uplift Modeling with Multiple Treatments. In *Proceedings of the 2020 SIAM International Conference on Data Mining (SDM)*, 2020.

16. **Yuta Saito**, Suguru Yaginuma, Yuta Nishino, Hayato Sakata, and Kazuhide Nakata. Unbiased Recommender Learning from Missing-Not-At-Random Implicit Feedback. In *Proceedings of the 13th International Conference on Web Search and Data Mining (WSDM)*, 2020.

17. **Yuta Saito**, Hayato Sakata, and Kazuhide Nakata. Doubly Robust Prediction and Evaluation Methods Improve Uplift Modeling for Observational Data. In *Proceedings of the 2019 SIAM International Conference on Data Mining (SDM)*, 2019.

International Conference Workshop Papers (refereed)

1. Haruka Kiyohara, Kosuke Kawakami, and **Yuta Saito**. Accelerating Offline Reinforcement Learning Application in Real-Time Bidding and Recommendation: Potential Use of Simulation. *RecSys 2021 Workshop on Simulation Methods for Recommender Systems (SimuRec)*, 2021.

2. **Yuta Saito**, Shunsuke Aihara, Megumi Matsutani, and Yusuke Narita. A Large-scale Open Dataset for Bandit Algorithms. *RecSys 2020 Workshop on Bandit and Reinforcement Learning from User Interactions (REVEAL)*, 2020 (**Oral Presentation**).

3. **Yuta Saito**, Takuma Udagawa, and Kei Tateno. Data-Driven Off-Policy Estimator Selection: An Application in User Marketing on An Online Content Delivery Service. *RecSys 2020 Workshop on Bandit and Reinforcement Learning from User Interactions (REVEAL)*, 2020.

4. **Yuta Saito**, Shunsuke Aihara, Megumi Matsutani, and Yusuke Narita. A Large-scale Open Dataset for Bandit Algorithms. *ICML 2020 Workshop on Real World Experiment Design and Active Learning (RealML)*, 2020.

5. Daisuke Moriwaki, Yuta Hayakawa, Isshu Munemasa, **Yuta Saito**, and Akira Matsui. Unbiased Lift-based Bidding System. In *Proceedings of the 2020 AdKDD&TargetAd Workshop, held in conjunction with the 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (AdKDD)*, 2020.

International Conference Tutorial/Workshop Proposals

1. **Yuta Saito** and Thorsten Joachims. Counterfactual Evaluation and Learning for Recommender Systems: Foundations, Implementations, and Recent Advances. In *Proceedings of the 28th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2022.

2. Olivier Jeunen, Thorsten Joachims, Harrie Oosterhuis, **Yuta Saito**, and Flavian Vasile. CONSEQUENCES – Causality, Counterfactuals and Sequential Decision-Making for Recommender Systems. In *Proceedings of the 16th ACM Conference on Recommender Systems (RecSys)*, 2022 (to appear).

3. **Yuta Saito** and Thorsten Joachims. Counterfactual Evaluation and Learning for Recommender Systems: Foundations, Implementations, and Recent Advances. In *Proceedings of the 15th ACM Conference on Recommender Systems (RecSys)*, 2021.

Awards

2022	Forbes Japan 30 Under 30 2022
2022	WSDM 2022 Best Paper Runner-Up Award
2021	NeurIPS 2021 Outstanding Reviewer Award

Scholarships

2022 -	**Masason Foundation Fellowship**
2021 - 2023	**Funai Overseas Scholarship**
	Doctoral research fellowship by the Funai Foundation (a private foundation in Japan).
	Granted two full years of tuition plus a monthly stipend of $3,000 for living expenses.

Involved Research Projects

- **Open Bandit Project** (https://github.com/st-tech/zr-obp)
  Open Bandit Project is an open-source research project that aims to enable realistic and reproducible experiments on bandit algorithms and their off-policy evaluation. The project consists of a large-scale real-world dataset called *Open Bandit Dataset* and Python software called *Open Bandit Pipeline*. Awarded **The Prime Minister's Award for Open Innovation by the Japanese Government**.

Professional Service

Conference Program Committee

- **KDD**	2022
- **AAAI**	2023
- **ICLR**	2022
- **WSDM**	2022, 2023
- **NeurIPS**	2021, 2022
- **ICML**	2021, 2022
- **AISTATS**	2021

Workshop Organizer

- RecSys 2022 Workshop on Causality, Counterfactuals, Sequential Decision-Making & Reinforcement Learning

Workshop Program Committee

- NeurIPS 2022 Workshop on Reinforcement Learning for Real Life - NeurIPS 2021 Workshop on Offline Reinforcement Learn
- NeurIPS 2021 Workshop on Causal Inference Challenges in Sequential Decision Making

Journal Reviewer

- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- ACM Transactions on Intelligent Systems and Technology (TIST)
- ACM Transactions on Information Systems (TOIS)
- Transactions on Machine Learning Research (TMLR)

Languages

Japanese (native), English (TOEFL iBT: 105)