

YUTA SAITO

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EDUCATION

Tokyo Institute of Technology, Tokyo

Apr 2016 - present

Bachelor of Engineering

Industrial Engineering and Economics.

RESEARCH INTERESTS

My research lies at the intersection of machine learning and causal inference called counterfactual machine learning. I am interested in the counterfactual nature of logged bandit feedback obtained from interactive systems, and ways of using biased real-world datasets to assist better decision making.

PUBLICATIONS

1. **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 ACM International Conference on Web Search and Data Mining (WSDM20), Houston, Texas, USA, Feb 3-7, 2020 (to appear).
2. **Yuta Saito**, Gota Morishita, and Shota Yasui, “[Dual Learning Algorithm for Delayed Feedback in Display Advertising](#)”. NeurIPS Workshop on Causal Machine Learning, Vancouver, British Columbia, Canada, Dec. 13-14, 2019 (to appear).
3. **Yuta Saito**, “Unbiased Pairwise Learning from Implicit Feedback”. NeurIPS Workshop on Causal Machine Learning, Vancouver, British Columbia, Canada, Dec. 13-14, 2019 (to appear).
4. **Yuta Saito** and Shota Yasui, “[Counterfactual Cross-Validation](#)”. ACM RecSys Workshop on Reinforcement and Robust Estimators for Recommendation (REVEAL), Copenhagen, Denmark, Sep 20, 2019.
5. **Yuta Saito**, Hayato Sakata, and Kazuhide Nakata, “[Doubly Robust Prediction and Evaluation Methods Improve Uplift Modeling for Observational Data](#)”. In Proceedings of the SIAM International Conference on Data Mining (SDM19), Calgary, Alberta, Canada, May 2-4, 2019. (**Oral Presentation**)

PREPRINTS

1. **Yuta Saito** and Shota Yasui, “[Counterfactual Cross-Validation: Effective Causal Model Selection from Observational Data](#)”, *arXiv:1909.05299*.
2. **Yuta Saito**, Suguru Yaginuma, Yuta Nishino, Hayato Sakata, and Kazuhide Nakata, “[Relevance Matrix Factorization](#)”, *arXiv:1909.03601*.
3. **Yuta Saito**, “[Eliminating Bias in Recommender Systems via Pseudo Labeling](#)”, *arXiv:1910.01444*.
4. **Yuta Saito**, Hayato Sakata, and Kazuhide Nakata, “[Cost-Effective and Stable Policy Optimization Algorithm for Uplift Modeling with Multiple Treatments](#)”.

WORK & INTERNSHIP EXPERIENCES

CyberAgent, Inc. AI Lab

Jun 2019 - present

Research Internship

- **Model selection for causal inference models:** Developed an evaluation metric that ranks the performance of the treatment effects prediction models accurately with high confidence. The proposed metric allows one to conduct valid model selection and hyper-parameter tuning of causal inference models.
- **Offline learning with delayed feedback data in display advertising:** Developed a new algorithm for the offline conversion rate prediction. The proposed method is the first of its kind of solving the two well-known difficulties of the delayed feedback problem in a theoretically principal way.

Nakata Lab, Tokyo Institute of Technology
Research Assistant

Apr 2019 - present

- **Treatment allocation optimization:** Developed a cost-effective and stable treatment allocation algorithm. The proposed method is the combination of the tree-based uplift modeling method and the doubly robust estimator in causal inference.

So-net Media Networks Corp., a.i lab.
Research Internship

Dec 2017 - Sep 2019

- **Debiasing recommender systems:** Developed an estimator for the loss function of interest for the implicit recommendation problem. The proposed estimator is the first unbiased estimator solving the positive-unlabeled and the missing-not-at-random problems simultaneously.
- **Offline lift-effect prediction:** Developed an easy to implement and scalable prediction method in uplift modeling. The proposed method can be used to effectively personalize advertising allocations.

Cancer Scan
Data Science Internship

Oct 2017 - Feb 2018

- **Public health treatments optimization:** Optimized the leaflet design to push up the medical examination rate using tools of statistics and causal inference.

PERSONAL RESEARCH PROJECTS

Using unsupervised domain adaptation for debiasing recommender systems. *2019*

- Constructed a new theory of recommendation with missing-not-at-random feedback using the theoretical framework of unsupervised domain adaptation. The proposed method can alleviate bias and solve the limitations of previously proposed causality-based approaches.

Eliminating Bias in Recommender Systems via Pseudo-Labeling. *2019*

- Applied a well-performing asymmetric tri-training framework in unsupervised domain adaptation to the missing-not-at-random recommendation. I also conducted a theoretical analysis of the strength of the proposed prediction method in the recommendation setting.

Unbiased Pairwise Learning from Implicit Feedback. *2019*

- Developed an unbiased pairwise loss function and a corresponding ranking algorithm. The proposed algorithm empirically outperforms the existing baseline methods, including matrix factorization and Bayesian personalized ranking.

INVITED TALKS AND PRESENTATIONS

“Intersection of Causal Inference and Machine Learning: An Overview” *Oct 2019*
@ Mitsubishi UFJ Research and Consulting and Metrics Work Consultants Inc.

- An overview talk on the recent interaction between causal inference and machine learning techniques.

“Predicting Heterogeneous Causal Effects using Machine Learning”

Oct 2019

@ 2019 Japanese Economic Association Autumn Meeting

- An introduction to the recent developments of prediction methods of heterogeneous causal effects

“Recent Topics on Counterfactual Machine Learning”

Jul 2019

@ Sony Corporation

- A broad overview of the field of Counterfactual Machine Learning, including causality-based personalization and debiasing of interactive systems.

“Debiasing Recommender Systems using Methods of Causal Inference”

Jul 2019

@ 1st Seminar on Counterfactual Machine Learning

- An introduction of the causality-based debiasing methods for the missing-not-at-random recommendation.

“Recent Topics on Unbiased Learning to Rank”

Jun 2019

@ Recruit, Data Science Team

- Basic concept of the unbiased learning-to-rank and a recently proposed interesting algorithm.

“Unsupervised Domain Adaptation and Its Application to CTR Prediction”

May 2019

@ CyberAgent, Inc., AI Lab

- An introduction to the theory of unsupervised domain adaptation and its potential application to the click-through rate prediction.

AWARDS

2nd place: DATA DEMOCRACY DAYS

Apr 2018

@ Culture Convenience Club Co., Ltd.

- Proposed a relationship app using the matrix completion technique.

COMPETENCES

Programming and Libraries: Python, R, Matlab, MySQL, L^AT_EX, Scikit-Learn, Tensorflow, EconML

Languages: English, Japanese