

# Masatoshi Uehara

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## Education

- 2020–2023 **PhD, Computer Science**, *Cornell University*, New York City.  
I transferred my PHD status from Harvard to Cornell. So I am currently the fifth-year PhD student.
- 2017–2020 **Master of Science, Statistics**, *Harvard University*, Cambridge.
- 2013–2017 **Bachelor of Engineering, Applied Mathematics & Computer Science**, *The University of Tokyo*, Tokyo.

## Publications

My research interests are *Reinforcement learning*, *Causal Inference*, *Online learning and its application to Digital Marketing*.

† means alphabetical order following the convention. \* means I am the co-first/corresponding author. The other papers follow the contribution-based ordering.

### Representative Works

- [1] **Uehara, Masatoshi** and Wen Sun. Pessimistic model-based offline rl: Pac bounds and posterior sampling under partial coverage. *arXiv preprint arXiv:2107.06226*, 2021. **Presented at RL THEORY VIRTUAL SEMINAR**.
- [2] Nathan Kallus and **Uehara, Masatoshi**<sup>†,\*</sup>. Double reinforcement learning for efficient off-policy evaluation in markov decision processes. *JMLR (Short version is accepted in ICML 2020)*, 2020.
- [3] Nathan Kallus and **Uehara, Masatoshi**<sup>†,\*</sup>. Efficiently breaking the curse of horizon: Double reinforcement learning in infinite-horizon processes. *Minor Revision (Operations research)*, 2019.

### Conference Proceedings

- [4] Jonathan D Chang, **Uehara, Masatoshi**<sup>\*</sup>, Dhruv Sreenivas, Rahul Kidambi, and Wen Sun. Mitigating covariate shift in imitation learning via offline data without great coverage. *Neurips*, 2021.
- [5] Nathan Kallus, Yuta Saito, and **Uehara, Masatoshi**<sup>†,\*</sup>. Optimal off-policy evaluation from multiple logging policies. In *ICML*, 2021.
- [6] Yichun Hu, Nathan Kallus, and **Uehara, Masatoshi**<sup>†</sup>. Fast rates for the regret of offline reinforcement learning. *COLT*, 2021. Will be presented at RL THEORY VIRTUAL SEMINAR 2021/11/26.
- [7] **Uehara, Masatoshi**, Masahiro Kato, and Shota Yasui. Off-policy evaluation and learning for external validity under a covariate shift. In *NeurIPS (Spotlight)*, 2020.

- [8] Nathan Kallus and **Uehara, Masatoshi**<sup>†,\*</sup>. Doubly robust off-policy value and gradient estimation for deterministic policies. *NeurIPS*, 2020.
  - [9] **Uehara, Masatoshi**, Jiawei Huang, and Nan Jiang. Minimax weight and q-function learning for off-policy evaluation. In *ICML*, 2020.
  - [10] Nathan Kallus and **Uehara, Masatoshi**<sup>†,\*</sup>. Statistically efficient off-policy policy gradients. In *ICML*, 2020.
  - [11] **Uehara, Masatoshi**, Takeru Matsuda, and Jae Kwang Kim. Imputation estimators for unnormalized models with missing data. In *AISTATS*, 2020.
  - [12] **Uehara, Masatoshi**, Takafumi Kanamori, Takashi Takenouchi, and Takeru Matsuda. Unified estimation framework for unnormalized models with statistical efficiency. *AISTATS*, 2020.
  - [13] Nathan Kallus and **Uehara, Masatoshi**<sup>†,\*</sup>. Intrinsically efficient, stable, and bounded off-policy evaluation for reinforcement learning. *NeurIPS*, 2019.
- Journal Articles
- [14] Takeru Matsuda, **Uehara, Masatoshi**, and Aapo Hyvarinen. Information criteria for non-normalized models. *JMLR*, 2021.
- Unpublished Articles
- [15] **Uehara, Masatoshi**, Masaaki Imaizumi, Nan Jiang, Nathan Kallus, Wen Sun, and Tengyang Xie. Finite sample analysis of minimax offline reinforcement learning: Completeness, fast rates and first-order efficiency. *arXiv preprint arXiv:2102.02981*, 2021.
  - [16] **Uehara, Masatoshi**, Xuezhou Zhang, and Wen Sun. Representation learning for online and offline rl in low-rank mdps. *arXiv preprint arxiv:2110.04652*, 2021. **Oral Paper in Ecological Theory of Reinforcement Learning Workshop at Neurips.**
  - [17] Nathan Kallus, Xiaojie Mao, and **Uehara, Masatoshi**<sup>†</sup>. Causal inference under unmeasured confounding with negative controls: A minimax learning approach. *arXiv preprint arXiv:2103.14029*, 2021.
  - [18] Nathan Kallus and **Uehara, Masatoshi**<sup>†,\*</sup>. Efficient evaluation of natural stochastic policies in offline reinforcement learning. *arXiv preprint arXiv:2006.03886*, 2020.
  - [19] Nathan Kallus, Xiaojie Mao, and **Uehara, Masatoshi**<sup>†</sup>. Localized debiased machine learning: Efficient estimation of quantile treatment effects, conditional value at risk, and beyond. *arXiv preprint arXiv:1912.12945*, 2020. **Presented at Online Causal Inference Seminar 2020/9/15.**
  - [20] **Uehara, Masatoshi** and Jae Kwang Kim. Semiparametric response model with nonignorable nonresponse. *arXiv preprint arXiv:1810.12519*, 2018.
  - [21] **Uehara, Masatoshi**, Issei Sato, Masahiro Suzuki, Kotaro Nakayama, and Yutaka Matsuo. Generative adversarial nets from a density ratio estimation perspective. *arXiv preprint arXiv:1610.02920*, 2016.

## Computer skills

In my papers, I implemented models related to generative adversarial networks, medical image segmentation and deep reinforcement learning etc. As a CS PhD student, I completed fundamental CS courses about compilers, Operating Systems and Algorithms.

Programming Languages Python (PyTorch), R, C, C++ (Open MP, MPI, Open CV)

## Teaching Assistantship

Spring, 2019 : **STAT 171: Intro to Stochastic Processes**, Harvard.

Fall, 2018 : **STAT 139: Linear Model**, Harvard.

## Services

**Conference Organizers:** Causal Inference Challenges in Sequential Decision Making: Bridging Theory and Practice in Neurips 2021

**Conferences reviewing:** ICML (2020,2021), Neurips (2020,2021), AISTATS (2020,2021), Offline Reinforcement Learning Workshop in Neurips (2020,2021), Workshop On Reinforcement Learning Theory in ICML 2021, Ecological Theory of Reinforcement Learning: How Does Task Design Influence Agent Learning? in Neurips 2021

**Journals reviewing:** Annals of Statistics, Journal of the American Statistical Association, Biometrika, Journal of the Royal Statistical Society: Series B, IEEE Transactions on Information Theory, Journal of Machine Learning Research, Annals of the Institute of Statistical Mathematics