

Han Bao

Assistant Professor at Kyoto University

Email : bao@i.kyoto-u.ac.jp

Website : <https://hermite.jp/>

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EDUCATION

- **The University of Tokyo** *Apr. 2019 – Mar. 2022*
Ph.D. in Computer Science (Supervisor: Prof. Masashi Sugiyama)
Thesis title: Excess Risk Transfer and Learning Problem Reduction towards Reliable Machine Learning
- **The University of Tokyo** *Apr. 2017 – Mar. 2019*
M.Sc. in Computer Science (Supervisor: Prof. Masashi Sugiyama)
Thesis title: Classification from Pairwise Information
- **The University of Tokyo** *Apr. 2013 – Mar. 2017*
B.Sc. in Information Science (Supervisor: Prof. Masashi Sugiyama)
Thesis title: Multiple Instance Learning from Positive and Unlabeled Data

WORK EXPERIENCES & ACTIVITIES

- **Kyoto University Hakubi Center (Kyoto, Japan)** *Apr. 2022 – Current*
Program-specific assistant professor
- **Okinawa Institute of Science and Technology (Okinawa, Japan)** *Apr. 2023 – Current*
Visiting scholar
- **ENSAI (Rennes, France)** *Feb. 2023 – Mar. 2023*
Visiting faculty
- **RIKEN Center for Advanced Intelligence Project (Tokyo, Japan)** *Apr. 2017 – Mar. 2022*
Research assistant in the imperfect information learning team
- **University of Michigan (Ann Arbor, MI, USA)** *Oct. 2019 – Feb. 2020*
Visiting scholar (Host: Prof. Clayton Scott)
- **Preferred Networks, Inc (Tokyo, Japan)** *Apr. 2017 – Dec. 2018*
Part-time engineer working on distributed deep learning
- **Preferred Networks, Inc (Tokyo, Japan)** *Sep. 2016 – Sep. 2016*
Internship working on generating 3D motions

AWARDS & FUNDINGS

- **Presentation Award Finalist at IBIS2023** *Nov. 2023*
Presentation at the 26th Information-Based Induction Sciences Workshop (IBIS2023)
- **Kyoto University Hakubi Fellowship** *Apr. 2022 – Sep. 2026*
Research fellowship and assistant professor position at Kyoto University (40K USD / year)
- **Funai Information Technology Award for Young Researchers** *Mar. 2023*
Research award for distinguished young researchers in the information technology field
- **Presentation Award at IBIS2022** *Nov. 2022*
Presentation at the 25th Information-Based Induction Sciences Workshop (IBIS2022)
- **Best Award at IBIS2020** *Nov. 2020*
Presentation at the 23rd Information-Based Induction Sciences Workshop (IBIS2020)
- **Student Presentation Award at IBIS2019** *Nov. 2019*
Presentation at the 22nd Information-Based Induction Sciences Workshop (IBIS2019)
- **JSPS Research Fellowship DC1** *Apr. 2019 – Mar. 2022*
Japanese domestic Ph.D. fellowship (31K USD)
- **Best Poster Award at JIML2018** *Nov. 2018*
Poster presentation at Japan-Israel Machine Learning Meeting (JIML2018)

- **JST ACT-I**

Research funding sponsored by Japan Science and Technology Agency (JST) (30K USD)

Oct. 2018 – Mar. 2020

- **JST AIP Challenge Program (Best Award)**

Research funding sponsored by Japan Science and Technology Agency (JST) (10K USD)

Aug. 2017 – Mar. 2018

BOOKS

1. Sugiyama, M., **Bao, H.**, Ishida, T., Lu, N., Sakai, T., and Niu, G. *Machine Learning from Weak Supervision: An Empirical Risk Minimization Approach*, MIT Press, Cambridge, MA, USA, 2022.

JOURNAL PUBLICATIONS

1. Takezawa, Y., **Bao, H.**, Niwa, K., Sato, R., and Yamada, M. Momentum Tracking: Momentum Acceleration for Decentralized Deep Learning on Heterogeneous Data. *Transactions on Machine Learning Research*, 2023.
2. **Bao, H.** and Sakaue, S. Sparse Regularized Optimal Transport with Deformed q -Entropy. *Entropy*, 24(11):1634, 2022.
3. Yamada, M., Takezawa, Y., Sato, R., **Bao, H.**, Kozareva, Z., and Ravi, S. Approximating 1-Wasserstein Distance with Trees. *Transactions on Machine Learning Research*, 2022.
4. Shimada, T., **Bao, H.**, Sato, I., and Sugiyama, M. Classification from Pairwise Similarities/Dissimilarities and Unlabeled Data via Empirical Risk Minimization. *Neural Computation*, 33(5):1234-1268, 2021.
5. **Bao, H.**, Sakai, T., Sato, I., and Sugiyama, M. Convex Formulation of Multiple Instance Learning from Positive and Unlabeled Bags. *Neural Networks* 105:132–141, 2018.

CONFERENCE PROCEEDINGS

1. Takezawa, Y.*, Sato, R.*, **Bao, H.**, Niwa, K., and Yamada, M. Beyond Exponential Graph: Communication-Efficient Topologies for Decentralized Learning via Finite-time Convergence. *Advances in Neural Information Processing Systems 36 (NeurIPS2023)*, 76692–76717, 2023.
2. Hataya, R., **Bao, H.**, and Arai, H. Will Large-scale Generative Models Corrupt Future Datasets? In *Proceedings of IEEE International Conference on Computer Vision (ICCV2023)*, 20555–20565, 2023.
3. Lin, X., Zhang, G., Lu, X., **Bao, H.**, Takeuchi, K., and Kashima, H. Estimating Treatment Effects Under Heterogeneous Interference. In *Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECMLPKDD2023)*, LNCS 14169:576–592, 2023.
4. **Bao, H.** Proper Losses, Moduli of Convexity, and Surrogate Regret Bounds. In *Proceedings of 36th Annual Conference on Learning Theory (COLT2023)*, PMLR 195:525–547, 2023.
5. Arase, Y., **Bao, H.**, and Yokoi, S. Unbalanced Optimal Transport for Unbalanced Word Alignment. In *Proceedings of 61st Annual Meeting of the Association for Computational Linguistics (ACL2023)*, 3966–3986, 2023.
6. Nakamura, S., **Bao, H.**, and Sugiyama, M. Robust Computation of Optimal Transport by β -potential Regularization. In *Proceedings of 14th Asian Conference on Machine Learning (ACML2022)*, PMLR 189:770–785, 2022.
7. **Bao, H.**, Nagano, Y., and Nozawa, N. On the Surrogate Gap between Contrastive and Supervised Losses. In *Proceedings of 39th International Conference on Machine Learning (ICML2022)*, PMLR 162:1585–1606, 2022. (Equal contribution & alphabetical ordering)
8. **Bao, H.***, Shimada, T.* , Xu, L., Sato, I., and Sugiyama, M. Pairwise Supervision Can Provably Elicit a Decision Boundary. In *Proceedings of 25th International Conference on Artificial Intelligence and Statistics (AISTATS2022)*, PMLR 151:2618–2640, 2022. (* Equal contribution)
9. Dan, S., **Bao, H.**, and Sugiyama, M. Learning from Noisy Similar and Dissimilar Data. In *Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECMLPKDD2021)*, LNCS 12976:233–249, 2021.
10. **Bao, H.** and Sugiyama, M. Fenchel-Young Losses with Skewed Entropies for Class-posterior Probability Estimation. In *Proceedings of 24th International Conference on Artificial Intelligence and Statistics (AISTATS2021)*, PMLR 130:1648–1656, 2021.

11. Nordström, M., **Bao, H.**, Löfman, F., Hult, H., Maki, A., and Sugiyama, M. Calibrated Surrogate Maximization of Dice. In *Proceedings of 23rd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI2020)*, LNCS 12264:269–278, 2020.
12. **Bao, H.**, Scott, C., and Sugiyama, M. Calibrated Surrogate Losses for Adversarially Robust Classification. In *Proceedings of 33rd Annual Conference on Learning Theory (COLT2020)*, PMLR 125:408–451, 2020.
13. **Bao, H.** and Sugiyama, M. Calibrated Surrogate Maximization of Linear-fractional Utility in Binary Classification. In *Proceedings of 23rd International Conference on Artificial Intelligence and Statistics (AISTATS2020)*, PMLR 108:2337–2347, 2020.
14. Wu, Y.-H., Charoenphakdee, N., **Bao, H.**, Tangkaratt, V., and Sugiyama, M. Imitation Learning from Imperfect Demonstration. In *Proceedings of International Conference on Machine Learning (ICML2019)*, PMLR 97:6818–6827, 2019.
15. Kuroki, S., Charoenphakdee, N., **Bao, H.**, Honda, J., Sato, I., and Sugiyama, M. Unsupervised Domain Adaptation Based on Source-guided Discrepancy. In *Proceedings of AAAI Conference on Artificial Intelligence (AAAI2019)*, 33 01:4122–4129, 2019.
16. **Bao, H.**, Niu, G., and Sugiyama, M. Classification from Pairwise Similarity and Unlabeled Data. In *Proceedings of International Conference on Machine Learning (ICML2018)*, PMLR 80:461–470, 2018.
17. **Bao, H.**, Usui, T., and Matsuura, K. Improving Optimization Level Estimation of Malware by Feature Selection. In *Proceedings of the 32nd Symposium on Cryptography and Information Security*, 2015.

PROFESSIONAL ACTIVITIES

- **Journal Reviewer:** Journal of Machine Learning Research (JMLR), Transactions on Machine Learning Research (TMLR), Neural Computation
- **Conference Reviewer:** NeurIPS (2019–2023), ICML (2019–2024), ICLR (2023), AISTATS (2019–2022, 2024), ALT (2024), UAI (2021–2022), AAAI (2019), ICMLA (2021)