

Heishiro Kanagawa

✉ heishiro.kanagawa@gmail.com

🌐 <https://noukoudashisoup.github.io>

🌐 <http://linkedin.com/in/kanagawa-heishiro-651774115/>

🌐 <https://github.com/noukoudashisoup>

I am a researcher in statistical machine learning with publications in top-tier venues, including ICML, NeurIPS, and the Journal of the Royal Statistical Society (Series B), reflecting recognition in both machine learning and statistics communities.

Education

- 2017 – 2022 ■ **Ph.D., Gatsby Computational Neuroscience Unit, University College London, United Kingdom** in Machine Learning.
Thesis title: *Statistical model evaluation using reproducing kernels and Stein's method.*
Advisor: Arthur Gretton.
- 2015 – 2017 ■ **M.Sc., Tokyo Institute of Technology, Japan** in Machine Learning.
Thesis title: *Cross-domain recommendation via deep domain adaptation.*
Advisor : Taiji Suzuki.
- 2012 – 2015 ■ **B.Sc., Tokyo Institute of Technology, Japan** in Computer Science.
Thesis title: *Nonparametric tensor estimation with Gaussian processes.*
Advisor : Taiji Suzuki.

Work Experience

- Nov. 2022 – Present ■ **Research Associate.** School of Mathematics, Statistics and Physics, Newcastle University, UK. Host: Chris Oates.
- Jul.2019 – Oct. 2019 ■ **Research Intern.** Facebook Reality Labs, Facebook, Redmond, WA, USA.
Description: Development of models of human episodic memory and event recognition. Bayesian modelling of behavioural data.
- Jun.2017 – Aug.2017 ■ **Research Assistant.** RIKEN Center for Advanced Intelligence Project (AIP), Tokyo, Japan.
Description: Literature survey of few-shot learning.
- Jul.2015 – Aug.2017 ■ **Research Intern.** Yahoo! JAPAN, Tokyo, Japan.
Description: Research on cross-domain recommender systems. Part of the work published at ECIR 2019. US patent (US11699095B2).

Research Publications

Working Papers

- 1 Liu, Q., Kanagawa, H., Fisher, M. A., Briol, F.-X., & Oates, C. J. (2025). *Fast approximate solution of Stein equations for post-processing of MCMC.* Under review. arXiv: 2501.06634
- 2 Kanagawa, H., Barp, A., Gretton, A., & Mackey, L. (2024). *Controlling moments with kernel Stein discrepancies.* Under review. arXiv: 2211.05408v5

Journal Articles

- 1 Kanagawa, H., Jitkrittum, W., Mackey, L., Fukumizu, K., & Gretton, A. (2023, May). A kernel Stein test for comparing latent variable models. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 85(3), 986–1011.

Conference Proceedings

- 1 Wang, C., Chen, W., **Kanagawa, H.**, & Oates, C. J. (2024). Reinforcement learning for adaptive MCMC. To appear at **AISTATS 2025**. arXiv: 2405.13574
- 2 Wang, C., Chen, W., **Kanagawa, H.**, & Oates, C. J. (2023, December). Stein II-importance sampling. In *Advances in Neural Information Processing Systems 36 (NeurIPS 2023)*.
- 3 Baum*, J., Kanagawa*, H., & Gretton, A. (2023). A kernel Stein test of goodness of fit for sequential models. In *Proceedings of the 40th international conference on machine learning (ICML 2023)*. *Equal contribution.
- 4 Xu, L., **Kanagawa, H.**, & Gretton, A. (2021). Deep Proxy Causal Learning and its Application to Confounded Bandit Policy Evaluation. In *Advances in Neural Information Processing Systems 35 (NeurIPS 2021)*.
- 5 Jitkrittum, W., **Kanagawa, H.**, & Schölkopf, B. (2020). Testing Goodness of Fit of Conditional Density Models with Kernels. In *Proceedings of the Thirty-Sixth Conference on Uncertainty in Artificial Intelligence (UAI 2020)*.
- 6 Wenliang, L. K., Moskovitz, T., **Kanagawa, H.**, & Sahani, M. (2020). Amortised Learning by Wake-Sleep. In *Proceedings of the 37th international conference on machine learning (ICML 2020)*.
- 7 **Kanagawa, H.**, Kobayashi, H., Shimizu, N., Tagami, Y., & Suzuki, T. (2019). Cross-domain Recommendation via Deep Domain Adaptation. In *Advances in Information Retrieval 40th European Conference on IR Research (ECIR 2019)*.
- 8 Jitkrittum, W., **Kanagawa, H.**, Sangkloy, P., Hays, J., Schölkopf, B., & Gretton, A. (2018). Informative Features for Model Comparison. In *Advances in Neural Information Processing Systems 31 (NeurIPS 2018)*.
- 9 **Kanagawa, H.**, Suzuki, T., Kobayashi, H., Shimizu, N., & Tagami, Y. (2016). Gaussian process nonparametric tensor estimator and its minimax optimality. In *Proceedings of the 33rd international conference on machine learning (ICML 2016)*.
- 10 Suzuki, T., **Kanagawa, H.**, Kobayashi, H., Shimizu, N., & Tagami, Y. (2016). Minimax Optimal Alternating Minimization for Kernel Nonparametric Tensor Learning. In *Advances in Neural Information Processing Systems 29 (NeurIPS 2016)*.

Workshop Papers

- 1 Wenliang, L. K. & **Kanagawa, H.** (2021). *Blindness of score-based methods to isolated components and mixing proportions*. Refereed by two anonymous reviewers. arXiv: 2008.10087

Academic Service and Administration Experience

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| Reviewer | <ul style="list-style-type: none"> ■ AISTATS, ICLR, JMLR, Neural Networks, NeurIPS, TMLR, Biometrika, Bernoulli, Electric Journal of Statistics, Journal of Multivariate Analysis, SIMODS |
| Workshop | <ul style="list-style-type: none"> ■ Organiser, Next-Generational Kernel Methods, Newcastle University, 2023 |
| Admin | <ul style="list-style-type: none"> ■ Student representative at Gatsby Unit, UCL, 2019-2021 ■ Member of the Gatsby Student-Staff Consultative Committee, 2019-2021 ■ Organiser, the Gatsby external seminar series, 2020-2021 |
| Mentor | <ul style="list-style-type: none"> ■ School mentoring scheme for PhD Students, Newcastle University, 2023 |

Invited Talks

Conferences and Workshops

- 2024
 - Joint Statistical Meetings
 - Bernoulli-IMQ World Congress in Probability and Statistics
 - Workshop on Stein's Method and Networks, Oxford
- 2023
 - Bayes Comp 2023: Invited Session (Stein Discrepancies)
 - Lifting Inference with Kernel Embeddings (LIKE23), Bern, Switzerland
- 2022
 - Stein's Method: The Golden Anniversary, Institute for Mathematical Sciences, National University of Singapore, Singapore
- 2020
 - Workshop on Emerging Themes in Computational Statistics, Institute of Statistical Mathematics, Tokyo, Japan
- 2019
 - Workshop on Functional Inference and Machine Intelligence, Institute of Statistical Mathematics, Tokyo, Japan.

External Seminars

- 2024
 - Fundamentals of Statistical Machine Learning Group, University College London
 - Statistics Seminar, King's College London
 - Statistical Machine Learning Seminar, Institute of Statistical Mathematics, Tokyo
 - Algorithms and Computationally Intensive Inference Seminars, University of Warwick
 - Statistics Seminar, University of Edinburgh
- 2022
 - Seminar on Advances in Probabilistic Machine Learning, Aalto University and ELLIS unit Helsinki
- 2019
 - Twitter, London, UK
 - University of Bristol, Bristol, UK
 - Alan Turing Institute, London, UK

Outreach Activities

- 2019
 - Algothon 2019, BlackRock, London, UK — Introduced state-of-the-art AI research to undergraduate students.

Thesis Supervision / Mentorship

- Jerome Baum (MSc.), 2022. Thesis title: "Kernel Goodness-of-Fit Testing for Sequences." Part of this work published at ICML 2023.
- Lizhang Chen (Intern), 2021. Project title: "Developing diagnostic tools for probabilistic models using the Pyro probabilistic programming language."
- Andrew Jiang (MSc.), 2020. Thesis title: "Kernel Tests for Markov Chain Monte Carlo Methods."

Teaching Experience

Teaching assistant

- 2024
 - Probabilistic Numerics Spring School, Southampton: Helped students with Python coding at practical labs.
 - Advanced Topics in Statistics, Newcastle University: A course on the theory of reproducing kernel Hilbert spaces, and its applications to Monte Carlo methods.
- 2018
 - Advanced Topics in Machine Learning, UCL
 - Probabilistic and Unsupervised Learning, UCL

Teaching Experience (continued)

- ▀ Approximate Inference and Learning in Probabilistic Models, UCL

Skills

Coding ▀ Python, MATLAB, R, PyTorch, git, Pandas

Awards and Achievements

- 2024 ▀ **IMS New Researcher Travel Award**
- 2018 ▀ **NeurIPS 2018 Travel Award**
- 2017-2022 ▀ **Gatsby Unit Studentship** Fully-funded PhD studentship with a stipend awarded to 2-4 students per year.
- 2015-2017 ▀ **Kawamura-Ikueikai Scholarship** (720,000 JPY per annum)
- 2013 ▀ **Nikki-Saneyoshi Scholarship** (300,000 JPY)