Hiroaki Yamagiwa

Ph.D. student, Graduate School of Informatics, Kyoto University, Kyoto, Japan
E-mail: hiroaki.yamagiwa@sys.i.kyoto-u.ac.jp
Profiles: Portfolio — Google Scholar — GitHub — LinkedIn

RESEARCH INTERESTS

- The properties of embeddings, especially their distributions and interpretability.
- Understanding the internal structure of language models.

EDUCATION

Kyoto University, Kyoto, Japan   Apr. 2022 — Present
Ph.D. student in Informatics

Kyoto University, Kyoto, Japan   Apr. 2020 — Mar. 2022
Master of Science in Informatics

Kyoto University, Kyoto, Japan   Apr. 2015 — Mar. 2020
Bachelor of Science in Mathematics

EXPERIENCE

Research Intern   Aug. 2023
Rist Inc.   Kyoto, Japan
We proposed a new zero-shot edge detection method [6] that was accepted at the WACV 2024 workshop.

Research Assistant   Apr. 2023 — Present
Kyoto University   Kyoto, Japan

Teaching Assistant   Oct. 2021 — Jun. 2022
Kyoto University   Kyoto, Japan
I was a TA for the course "Applied Mathematics and Physics Laboratory".

Part-time Researcher   Aug. 2021 — Mar. 2022
RIKEN   Remote, Japan

Part-time Engineer   Dec. 2020 — Jul. 2021
DATAGRID Inc.   Kyoto, Japan
Natural Language Processing Engineer.

Part-time Engineer   Sep. 2019 — Sep. 2024
Rist Inc.   Kyoto, Japan
Machine Learning Engineer.

PREPRINT

1. Momose Oyama, Hiroaki Yamagiwa, Yusuke Takase, and Hidetoshi Shimodaira. Mapping 1,000+ Language Models via the Log-Likelihood Vector. arXiv, 2025.
2. Ryo Kishino, Hiroaki Yamagiwa, Ryo Nagata, Sho Yokoi, and Hidetoshi Shimodaira. Quantifying Lexical Semantic Shift via Unbalanced Optimal Transport. arXiv, 2024.
3. Hiroaki Yamagiwa, Ryoma Hashimoto, Kiwamu Arakane, Ken Murakami, Shou Soeda, Momose Oyama, Yihua Zhu, Mariko Okada, and Hidetoshi Shimodaira. Predicting Drug-Gene Relations via Analogy Tasks with Word Embeddings. arXiv, 2024.

PUBLICATIONS

($*$) denotes equal contribution.

1. Hiroaki Yamagiwa and Hidetoshi Shimodaira. Norm of Mean Contextualized Embeddings Determines their Variance. In Proceedings of the 31st International Conference on Computational Linguistics (COLING 2025), pages 7778–7808, 2025.
2. Hiroaki Yamagiwa, Momose Oyama, and Hidetoshi Shimodaira. Revisiting Cosine Similarity via Normalized ICA-transformed Embeddings. In Proceedings of the 31st International Conference on Computational Linguistics (COLING 2025), pages 7423–7452, 2025.
3. Momose Oyama, Hiroaki Yamagiwa, and Hidetoshi Shimodaira. Understanding Higher-Order Correlations Among Semantic Components in Embeddings. In Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP 2024), pages 2883–2899, 2024.
4. Hiroaki Yamagiwa, Yusuke Takase, and Hidetoshi Shimodaira. Axis Tour: Word Tour Determines the Order of Axes in ICA-transformed Embeddings. In Findings of the Association for Computational Linguistics: EMNLP 2024, pages 477–506, 2024.
5. Yunzhen He*, Hiroaki Yamagiwa*, and Hidetoshi Shimodaira. Shimo Lab at "Discharge Me!": Discharge Summarization by Prompt-Driven Concatenation of Electronic Health Record Sections. In Proceedings of the 23rd Workshop on Biomedical Natural Language Processing and BioNLP Shared Tasks, pages 645–657, 2024.
6. Hiroaki Yamagiwa, Yusuke Takase, Hiroyuki Kambe, and Ryosuke Nakamoto. Zero-Shot Edge Detection with SCE-SAME: Spectral Clustering-based Ensemble for Segment Anything Model Estimation. In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2024) Workshops, pages 541–551, 2024.
7. Hiroaki Yamagiwa*, Momose Oyama*, and Hidetoshi Shimodaira. Discovering Universal Geometry in Embeddings with ICA. In Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP 2023), pages 4647–4675, 2023.
8. Hiroaki Yamagiwa, Sho Yokoi, and Hidetoshi Shimodaira. Improving word mover's distance by leveraging self-attention matrix. In Findings of the Association for Computational Linguistics: EMNLP 2023, pages 11160—11183, 2023.

GRANTS

- Kyoto University Division of Graduate Studies SPRING Program (Apr. 2024 — Mar. 2025).
- Kyoto University Science and Technology Innovation Fellowship (Apr. 2022 — Mar. 2024).

RESEARCH ACTIVITIES

Reviewer

- **The 31st International Conference on Computational Linguistics (COLING 2025)**

SKILLS

- **Programming: Python, C++, Linux, Docker**
- **Language: Japanese, English**
- **Kaggle: Competitions Expert**

REFERENCES

Prof. Hidetoshi Shimodaira
Professor, Graduate School of Informatics, Kyoto University, Kyoto, Japan
E-mail: shimo@i.kyoto-u.ac.jp
Profiles: Portfolio — Google Scholar —GitHub — LinkedIn