Takashi Matsubara

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Education

Mar., 2015 **Ph.D. in Engineering**, Graduate School of System Engineering, Osaka University, Japan.

Mar., 2013 **Master of Engineering**, Graduate School of System Engineering, Osaka University, Japan.

Mar., 2011 **Bachelor of Engineering**, School of Engineering Science, Osaka University.

Selected Publications

1. K. Sueyoshi and **T. Matsubara**, "Predicated Diffusion: Predicate Logic-Based Attention Guidance for Text-to-Image Diffusion Models," *The IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR2024)*, Seattle, Jun. 2024.

2. T. Aoshima and **T. Matsubara**, "Deep Curvilinear Editing: Commutative and Nonlinear Image Manipulation for Pretrained Deep Generative Model," *The IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR2023)*, Vancouver, Jun. 2023.

3. **T. Matsubara** and T. Yaguchi, "FINDE: Neural Differential Equations for Finding and Preserving Invariant Quantities," *The Eleventh International Conference on Learning Representations (ICLR2023)*, Kigali, May 2023.

4. **T. Matsubara**, K. Sato, K. Hama, R. Tachibana, and K. Uehara, "Deep Generative Model using Unregularized Score for Anomaly Detection with Heterogeneous Complexity," *IEEE Transactions on Cybernetics*, vol. 52, no. 6, pp. 5161-5173, 2022.

5. Y. Chen, **T. Matsubara**, and T. Yaguchi, "KAM Theory Meets Statistical Learning Theory: Hamiltonian Neural Networks with Non-Zero Training Loss," *The Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI2022)*, online, Feb. 2022. (oral)

6. **T. Matsubara**, Y. Miyatake, and T. Yaguchi, "Symplectic Adjoint Method for Exact Gradient of Neural ODE with Minimal Memory," *Advances in Neural Information Processing Systems 34 (NeurIPS2021)*, online, Dec. 2021.

7. Y. Chen, **T. Matsubara**, and T. Yaguchi, "Neural Symplectic Form: Learning Hamiltonian Equations on General Coordinate Systems," *Advances in Neural Information Processing Systems 34 (NeurIPS2021)*, online, Dec. 2021. (spotlight)

8. T. Kimura, **T. Matsubara**, and K. Uehara, "ChartPointFlow for Topology-Aware 3D Point Cloud Generation," *ACM International Conference on Multimedia (ACMMM2021)*, online, Oct. 2021. (oral)

9. K. Hama, **T. Matsubara**, K. Uehara, and J. Cai, "Exploring Uncertainty Measures for Image-Caption Embedding-and-Retrieval Task," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 17, no. 2, article no. 46, 2021.

10. **T. Matsubara**, A. Ishikawa, and T. Yaguchi, "Deep Energy-Based Modeling of Discrete-Time Physics," *Advances in Neural Information Processing Systems 33 (NeurIPS2020)*, online, Dec. 2020. (oral)

Research Grants in 5 years

2024−2026 **ASPIRE for Rising Scientists**, JST, Japan. (20,800K JPY as a co-PI)

2024−2026 **Scientific Research (C), KAKENHI**, JSPS, Japan. (4,550K JPY as PI).

2023−2025 **Moonshot Research & Development Program**, JST, Japan. (43,225K JPY as a co-PI)

2021−2024 **PRESTO, Strategic Basic Research Programs**, JST, Japan. (45,500K JPY as PI)

2020–2024 **JST MIRAI Program**, JST, Japan. (43,165K JPY as a co-investigator).

2019–2024 **CREST, Strategic Basic Research Programs**, JST, Japan. (5,000K JPY as a collaborator)

2022–2023 **Moonshot Research & Development Program**, JST, Japan. (36,478K JPY as a co-investigator)

2021–2023 **Scientific Research (B), KAKENHI**, JSPS, Japan. (5,460K JPY as a co-investigator).

2019–2023 **Early-Career Scientists, KAKENHI**, JSPS, Japan. (4,160K JPY as a co-investigator)

2019–2022 **Scientific Research (B), KAKENHI**, JSPS, Japan. (5,980K JPY as a co-investigator)

2017–2020 **Strategic Information and Communications R&D Promotion Programme**, Ministry of Internal Affairs and Communications, Japan. (31,799K JPY as PI)

Awards in 5 years

2023 **JSAI Annual Conference Award** of Japan Society for Artificial Intelligence.

2023 **JSAI Annual Conference Award** of Japan Society for Artificial Intelligence.

2022 **Research Award Finalist of Technical Committee on Information-Based Induction Sciences and Machine Learning**, Institute of Electronics, Information and Communication Engineers (IEICE).

2021 **IBIS Workshop Best Presentation Award** of Information-Based Induction Science Workshop.

2021 **Research and Development Award** of Strategic Information and Communications R&D Promotion Programme, Ministry of Internal Affairs and Communications, Japan.

2020 **IBIS Workshop Presentation Award** of Information-Based Induction Science Workshop.

2020 **JSAI Annual Conference Award** of Japan Society for Artificial Intelligence.

2019 **Best Paper Award** of Korea-Japan Joint Workshop on Complex Communication Sciences.

Appointments

Full-Time Appointments

2024–present **Professor** at Faculty of Information Science and Technology, Hokkaido University, Japan.
Supervision: 3 masters, 5 bachelors.
Lecture: Information Algebra and Automata, Advanced Information Recognition, etc.

2020–2024 **Associate Professor** at Graduate School of Engineering Science, Osaka University, Japan.
Supervision: 2 PhDs, 12 masters, 14 bachelors.
Lecture: Intelligent Control, Nonlinear System Theory, Electrical Circuits, Complex Systems, etc.

2015–2020 **Assistant Professor** at Graduate School of System Informatics, Kobe University, Japan.
Supervision: 23 masters, 17 bachelors.
Lecture: Programming Practice 3, 4, etc.

2013–2015 **Research Fellow (DC1)** at The JSPS, Japan.

Visiting and Part-Time Appointments

2020–Present Technical Advisor at **Kubota Corporation.**

2019–2022 Technical Advisor at **KYOCERA Corporation.**

2021–2022 Technical Advisor at **AISIN CORPORATION.**

2021 PRESTO Researcher at **Japan Science and Technology Agency (JST)**, Japan.

2013–Present Visiting Researcher at **Center for Information and Neural Networks (CiNet)**, National Institute of Information and Communications Technology (NICT), Japan.

2018 Visiting Researcher at **Nanyang Technological University**, Singapore.