

Sho Kuno

Machine Learning Researcher & Algorithm Engineer (Tokyo)

Languages: Japanese (native), English (TOEFL iBT 103 / IELTS 7.5)

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Research Interests

- **Dynamical Systems & AI:** time-series, reservoirs, stability/phase
- **Geometric Deep Learning:** graphs, geometry-aware representations
- **Generative Models:** diffusion / flow matching, graph-structured data
- **3D Computer Vision & Digital Humans**

Education

- **Ph.D. Candidate, Advanced Interdisciplinary Engineering** 2026–
The University of Tokyo, Graduate School of Engineering (Advisor: Prof. Tatsuya Harada)
Scheduled research internship: Shanda AI Research Tokyo (Mar 2026–) — digital humans / generative AI / 3D vision.
- **M.S., Mathematical Informatics** 2024–2026 (expected)
The University of Tokyo, Graduate School of IST (Advisor: Prof. Kengo Nakajima)
WINGS-IIW Fellowship.
Thesis: *Generative Modeling of Graph-Structured Data via Latent Flow Matching*.
- **B.S., Mathematical Engineering and Information Physics** 2019–2024
The University of Tokyo, Faculty of Engineering (Advisor: Prof. Hiroshi Kori)
Thesis: *Reservoir computing for forced van der Pol oscillators with frequent phase shifts*.
- **Exchange Student (USTEP)** Sep 2021–Sep 2022
ETH Zurich, Department of Mathematics
Full academic-year exchange in pure mathematics.

Research Experience

Academic Research

- **Graduate Research (Master's)** Apr 2024–Present
Mathematical Informatics Lab No.3, University of Tokyo
Supervisor: Prof. Kengo Nakajima
Keywords: Latent Flow Matching; Graph Generation; Benchmarking; HPC
 - Designing latent flow matching frameworks for **graph generation**.
 - Benchmarking diffusion-based architectures as baselines for comparison.
 - Achieved competitive performance with SOTA methods and faster sampling than the diffusion-based baseline.
 - Conducting experiments and evaluations on **HPC** to assess generative performance.
- **Undergraduate Research** Sep 2023–Mar 2024
Mathematical Informatics Lab No.8, University of Tokyo
Supervisor: Prof. Hiroshi Kori
Keywords: Dynamical Systems; Reservoir Computing; Time-series Forecasting
 - Developed reservoir computing models for forecasting **forced van der Pol oscillators** with phase shifts to the external drive.
 - Summarized results into a peer-reviewed journal publication and a domestic oral presentation.
 - Published in *Machine Learning with Applications* [P1] and presented at the Physical Society of Japan annual meeting [T1].

Industry Research

- **Applied ML Research Experience in Industry** Mar 2024–Present
EQUES Inc. (University of Tokyo Matsuo Lab spin-off)
Keywords: Generative AI; Animation Inbetweening; Line-art Graphs; Diffusion Features; Color Pipeline
 - Enrolled in the METI/NEDO GENIAC consortium, researching and prototyping generative AI models for **2D line-art animation inbetweening**.

- Extended AnimeInbet (ICCV 2023) to support **color** pipelines via graph-based vertex matching.
- Extended AnimeInbet (ICCV 2023) to support **diffusion feature** pipelines via graph-based vertex matching.
- Co-authored SIGGRAPH 2025 poster submission [P2] and ACM MMAsia 2025 workshop paper [T3].
- Presented research outcomes at Visual Computing 2025 [T2], IBIS 2025 [T3], and IBIS 2025 Young Researchers Mentoring Program [T4].

Publications (Peer-reviewed)

- [P1] [Sho Kuno](#) and Hiroshi Kori, “Forecasting the forced van der Pol equation with frequent phase shifts using Reservoir Computing,” *Machine Learning with Applications*, vol. 19, p. 100654, 2025. DOI: [10.1016/j.mlwa.2025.100654](https://doi.org/10.1016/j.mlwa.2025.100654).
- [P2] Ryugo Morita, [Sho Kuno](#), Ryunosuke Tanaka, Rongzhi Li, Hoang Dai Dinh, and Issey Sukeda, “SAWNA: Space-Aware Text to Image Generation,” *SIGGRAPH 2025 Posters*, 2025. DOI: [10.1145/3721250.3743023](https://doi.org/10.1145/3721250.3743023).
- [P3] Riku Takahashi, Rongzhi Li, Yuta Oshima, [Sho Kuno](#), Ryugo Morita, and Issey Sukeda, “AKITalk: Audio-Implicit Keypoints for Identity-Preserving Talking-Head Video Synthesis,” *MMAsia '25 Workshops (ACM Multimedia in Asia)*, 2025. DOI: [10.1145/3769748.3773362](https://doi.org/10.1145/3769748.3773362).

Selected Presentations

- [T1] [Sho Kuno](#) and Hiroshi Kori, “Time Series Prediction of Shift Work-Simulated Forced Oscillators using Reservoir Computing,” *79th Annual Meeting of the Physical Society of Japan*, Hokkaido University, Sep 16–19, 2024 (Oral). Related publication: [10.1016/j.mlwa.2025.100654](https://doi.org/10.1016/j.mlwa.2025.100654).
- [T2] [Sho Kuno](#), Ryugo Morita, Ryunosuke Tanaka, Rongzhi Li, Hoang Dai Dinh, and Issey Sukeda, “CAGI: Color-Informed Anime Graph Inbetweening,” *Visual Computing 2025*, Waseda University, Sep 7–10, 2025 (Poster).
- [T3] [Sho Kuno](#), Ryugo Morita, Ryunosuke Tanaka, Rongzhi Li, Hoang Dai Dinh, and Issey Sukeda, “Line-Art Graph Correspondence with Diffusion Features and Optimal Transport,” *IBIS 2025*, Okinawa, Nov 12–15, 2025 (Poster).
- [T4] [Sho Kuno](#), “Line-Art Graph Correspondence with Diffusion Features and Optimal Transport,” *IBIS 2025 Young Researchers Mentoring Program*, Okinawa, Nov 11, 2025 (Oral).

Awards & Fellowships

- **WINGS-IIW Fellowship:** ¥180,000/month (3.5 years, from Fall 2025).
- **Toyota Riken Scholarship:** ¥1,000,000 (overseas graduate preparation, 1 year).

Teaching

- **Teaching Assistant:** Machine Learning & Optimization, University of Tokyo Extension (Aug 2025–Present).

Technical Skills

- **Programming:** Python, Rust, C/C++, MATLAB, L^AT_EX
- **ML / GenAI:** PyTorch, diffusion models, flow matching, GNNs, transformers, reservoir computing
- **Infrastructure / Tools:** Docker, Singularity, SLURM, Azure, HPC, Git/GitHub, Jupyter

Additional Experience

- **Research Assistant** Feb 2021–Mar 2021
Dr. John Pazdziora
Conducted archival research on 19th-century English literature; produced annotated bibliographies supporting grant proposals.