

Xingyu Song

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RESEARCH INTERESTS

Flow-based generative models; deterministic and stochastic generative dynamics; probability flows; bridge matching; physical simulation; action recognition; human behavior understanding; AI for scientific and security applications.

EDUCATION

The University of Tokyo PhD Student, Graduate School of Engineering. RCAST AI Lab, Department of Advanced Interdisciplinary Studies. Supervisors: Prof. Naoya Takeishi and Prof. Takehisa Yairi.	2025–Present
The University of Tokyo M.Eng., Graduate School of Engineering.	2022–2024
Waseda University Research Student, School of Fundamental Science and Engineering.	2021–2022
Chongqing University B.Sc., College of Hongshen / College of Computer Science.	2017–2021

HONORS AND AWARDS

- SPRING GX Fellowship, The University of Tokyo, 2025.

PUBLICATIONS

Generative Modeling and Physical Simulation

1. **Xingyu Song**, Yuan Mei, Naoya Takeishi. “Deterministic Decomposition of Stochastic Generative Dynamics.” arXiv preprint, 2026.
Studies the decomposition of generative drift into transport and osmotic components and introduces Bridge Matching for controllable sampling.
2. Yuan Mei, **Xingyu Song**, Xiaowen Song, Naoya Takeishi. “M3: Reframing Training Measures for Discretized Physical Simulations.” arXiv preprint, 2026.
Balances supervision across multi-scale Morton partitions to reduce measure-induced bias in neural surrogate models.

Natural Language Processing

1. Zhao Xinjie, Fan Gao, **Xingyu Song**, Yingjian Chen, Rui Yang, Yanran Fu, Yuyang Wang, Yusuke Iwasawa, Yutaka Matsuo, Irene Li. “ReAgent: Reversible Multi-Agent Reasoning for Knowledge-Enhanced Multi-Hop QA.” Proceedings of EMNLP, 2025.
2. Yunze Xiao, Tingyu He, Lionel Z. Wang, Yiming Ma, **Xingyu Song**, Xiaohang Xu, Mona T. Diab, Irene Li, Ka Chung Ng. “JiraiBench: A Bilingual Benchmark for Evaluating Large Language Models’ Detection of Human Risky Health Behavior Content in Jirai Community.” Proceedings of EACL, 2026.
3. Yingjian Chen, Feiyang Li, **Xingyu Song**, Tianxiao Li, Zixin Xu, Xiujie Chen, Issey Sukeda, Irene Li. “Exploring the Role of Knowledge Graph-Based RAG in Japanese Medical Question Answering with Small-Scale LLMs.” arXiv preprint, 2025.

Computer Vision and Action Recognition

1. **Xingyu Song**, Zhan Li, Shi Chen, Xin-Qiang Cai, Kazuyuki Demachi. “4A: An Animation-based Augmentation Approach for Action Recognition from Discontinuous Video.” Proceedings of ECAI, 2024. Oral presentation.
2. **Xingyu Song**, Zhan Li, Shi Chen, Kazuyuki Demachi. “Quater-GCN: Enhancing 3D Human Pose Estimation with Orientation and Semi-supervised Training.” Proceedings of ECAI, 2024. Oral presentation.
3. **Xingyu Song**, Zhan Li, Shi Chen, Kazuyuki Demachi. “GTAutoAct: An Automatic Datasets Generation Framework Based on Game Engine Redevelopment for Action Recognition.” arXiv preprint, 2024.

Intelligent Surveillance and Security

1. Zhan Li, **Xingyu Song**, Shi Chen, Kazuyuki Demachi. “Advancement and Development of Graph-Based Reasoning Method for Human Malicious Behaviors Identification Based on Graph Contrastive Representation Learning.” Neurocomputing, 2026.
2. Zhan Li, **Xingyu Song**, Shi Chen, Kazuyuki Demachi. “Armed Boundary Sabotage: A Case Study of Human Malicious Behaviors Identification with Computer Vision and Explainable Reasoning Methods.” Computers and Electrical Engineering, 121, 109924, 2025.
3. Zhan Li, **Xingyu Song**, Shi Chen, Kazuyuki Demachi. “Abnormal Detection in Nuclear Security Videos Based on Label-Specific Autoencoders and Reconstruction Errors Comparison.” Nuclear Engineering and Technology, 57(3), 103239, 2025.
4. Zhan Li, **Xingyu Song**, Shi Chen, Kazuyuki Demachi. “Data, Language and Graph-Based Reasoning Methods for Identification of Human Malicious Behaviors in Nuclear Security.” Expert Systems with Applications, 236, 121367, 2024.
5. **Xingyu Song**, Zhan Li, Shi Chen, Kazuyuki Demachi. “Game Engine Based Data Augmentation with In-game Customization and Modeling for Malicious Behaviors Identification in Nuclear Security.” INMM/ESARDA Joint Annual Meeting, 2023.
6. Zhan Li, **Xingyu Song**, Shi Chen, Kazuyuki Demachi. “Malicious Behaviors Identification in Nuclear Security Based on Visual Relationships Extraction and Knowledge Reasoning.” INMM/ESARDA Joint Annual Meeting, 2023.

RESEARCH AND INTERNSHIP EXPERIENCE

RCAST AI Lab, The University of Tokyo PhD research on flow-based generative models and the connections between deterministic and stochastic generative dynamics.	2025–Present
Sichuan Hwadee Information Technology Co., Ltd., Chengdu, China Internship.	2020.06–2020.08
National Key Laboratory of Software Development Environment, Beihang University, Beijing, China Research internship supervised by Prof. Zhiming Zheng.	2019.01–2019.03
ChinaSoft International, Chongqing, China Internship. Project: CQUHub .	2018.07–2018.09

SELECTED LINKS

- Homepage: <https://xingyu-song.github.io>
- GitHub: <https://github.com/xingyu-song>
- Google Scholar: [Profile search](#)