Lingwei Zhu

Curriculum Vitae

Assistant Professor
Reinforcement Learning for Industrial Science Lab,
School of Computing and Information Technology
Great Bay University, Songshan Lake, China

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Research Interests

Reinforcement Learning, theory and application of reinforcement learning for real-world complex problems such as large-scale automation, healthcare, brain cognition, etc.

Academic Positions

Assistant Professor 2025-present
RLIS Lab, Great Bay University, China

Project Researcher *supervisor: Yukie Nagai*
IRCN-CDR Lab, University of Tokyo, Japan 2024-2025

Postdoc Fellow *supervisor: Martha White*
RLAI Lab, University of Alberta, Canada 2022-2024

Education

Ph.D. with the Best Student Honor *supervisor: Takamitsu Matsubara*
Robot Learning Lab, Nara Institute of Science and Technology, Japan 2019-2022
Thesis title: Entropy regularization for scalable, safe and robust reinforcement learning

Master of Engineering *supervisor: Takamitsu Matsubara*
Robot Learning Lab, Nara Institute of Science and Technology, Japan 2017-2019
Thesis title: RL for Large-scale Process Control: application to vinyl acetate monomer process

Bachelor of Engineering
Tianjin Polytechnic University, China 2013-2017

Publications

Refereed Journal and Conference Articles

(† indicates joint first authors)

[1] Towards Physiologically Sensible Predictions via the Rule-based Reinforcement Learning Layer,
Lingwei Zhu, Z. Chen, Y. Nagai, J. Sun,
Preprint, 2025.

[2] Fat-to-Thin Policy Optimization: Offline RL with Sparse Policies,
Lingwei Zhu, H. Wang, Y. Nagai,
International Conference on Learning Representations (ICLR), 2025.

[3] q-Exponential Family for Policy Optimization,
Lingwei Zhu, H. Shah, H. Wang, Y. Nagai, M. White,
International Conference on Learning Representations (ICLR), 2025.

[4] Offline Reinforcement Learning with Tsallis Regularization,
Lingwei Zhu, M. Schlegel, H. Wang, M. White,
Transaction on Machine Learning Research (TMLR), 2024.

[5] Generalized Munchausen Reinforcement Learning using Tsallis KL Divergence,
Lingwei Zhu, Z. Chen, M. Schlegel, M. White,
Advances on Neural Information Processing Systems (NeurIPS), 2023.

[6] Cautious Policy Programming: Exploiting KL for Monotonic Policy Improvement in RL,
Lingwei Zhu, T. Matsubara, Machine Learning, 2023.

[7] Cyclic policy distillation: Sample-efficient sim-to-real RL with domain randomization,
Y. Kadokawa, Lingwei Zhu, Y. Tsurumine, T. Matsubara, Robotics and Autonomous Systems, 2023.

[8] Automated Sleep Staging via Parallel Frequency-Cut Attention, *Z. Chen, Z. Yang, Lingwei Zhu, W. Chen, T. Tamura, N. Ono, MD Altaf-Ul-Amin, S. Kanaya*, IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2023.

[9] Learning vector quantized representation for cancer subtypes identification,
Z. Chen†, Z. Yang†, Lingwei Zhu†, P. Gao, T. Matsubara, S. Kanaya, Md Altaf-Ul-Amin, Computer Methods and Programs in Biomedicine, 2023.

[10] Alleviating parameter-tuning burden in RL for large-scale process control,
Lingwei Zhu, G. Takami, M. Kawahara, H. Kanokogi, T. Matsubara, Computers and Chemical Engineering, 2022.

[11] A Two-View EEG Representation for Brain Cognition by Composite Temporal-Spatial Contrastive Learning,
Z. Chen†, Lingwei Zhu†, H. Jia, T. Matsubara, SIAM International Conference on Data Mining, 2023.

[12] Hierarchical Categorical Generative Modeling for Multi-omics Cancer Subtyping,
ZW. Yang†, Lingwei Zhu†, C. Li, Z. Chen, N. Ono, M. Altaf-Ul-Amin, S. Kanaya, International Conference on Bioinformatics and Biomedicine (BIBM), 2022.

[13] Automated cancer subtyping via vector quantization mutual information maximization, *Z. Chen†, Lingwei Zhu†, Z. Yang, T. Matsubara*, European Conference on Machine Learning (ECML), 2022.

[14] Multi-tier platform for cognizing massive electroencephalogram, *Z. Chen†, Lingwei Zhu†, Z. Yang, R. Zhang*, International Joint Conference on Artificial Intelligence (IJCAI), 2022.

[15] Cancer Subtyping via Embedded Unsupervised Learning on Transcriptomics Data,
Z. Yang, Lingwei Zhu, Z. Chen, M. Huang, N. Ono, MD. Altaf-Ul-Amin, S. Kanaya, IEEE Engineering in Medicine & Biology Society (EMBC), 2022.

[16] Adaptive Spike-Like Representation of EEG Signals for Sleep Stages Scoring,
Lingwei Zhu, Z. Yang, K. Odani, G. Shi, Y. Kan, Z. Chen, R. Zhang, IEEE Engineering in Medicine & Biology Society (EMBC), 2022.

[17] Cautious Actor-Critic,
Lingwei Zhu, T. Kitamura, T. Matsubara, Asian Conference on Machine Learning (ACML), 2021.

[18] Geometric Value Iteration: Dynamic Error-Aware KL Regularization for Reinforcement Learning,
T. Kitamura, Lingwei Zhu, T. Matsubara, Asian Conference on Machine Learning (ACML), 2021.

[19] Scalable reinforcement learning for plant-wide control of vinyl acetate monomer process,
Lingwei Zhu, G. Takami, H. Kanokogi, T. Matsubara, Control Engineering Practice, 2020.

[20] Dynamic actor-advisor programming for scalable safe reinforcement learning,
Lingwei Zhu, Y. Cui, T. Matsubara, IEEE International Conference on Robotics and Automation, 2020.

[21] Factorial Kernel Dynamic Policy Programming for Vinyl Acetate Monomer Plant Model Control,
Y. Cui†, Lingwei Zhu†, M. Fujisaki, H. Kanokogi, T. Matsubara, IEEE International Conference on Automation Science and Engineering (CASE), 2018.

International Patents

Inventor of apparatus, method, program and recording medium

- **United States patent Patent Number US20200057416A1**, *T. Matsubara, Y. Cui, Lingwei Zhu, et al.*,
- **European patent; Patent Number EP3620868A1**, *T. Matsubara, Y. Cui, Lingwei Zhu, et al.*,
- **Chinese patent; Patent Number CN110837893A**, *T. Matsubara, Y. Cui, Lingwei Zhu, et al.*,
- **Japanese patent; Patent Number JP2020027556A**, *T. Matsubara, Y. Cui, Lingwei Zhu, et al.*,

Awards and Honors

Prime Minister's Prize of Japan Industrial Technology Awards, 2023

Best Ph.D. student honor, Nara Institute of Science and Technology, 2022

National Scholarships:

- Japanese Society for Promotion of Science - DC2, (83/416, $\sim 19.8\%$), 2021-2022
- Japanese Government Scholarship (MEXT), 2020-2021

IEEE Kansai Chapter Paper Award, 2020
Awarded to *Dynamic actor-advisor programming for scalable safe reinforcement learning*

Academic Services

Program Commitee Member (Reviewer) 2021-present
JMLR, IEEE-TNNLS, TMLR, NeurIPS, ICLR, ICML
AAAI, AISTATS, IJCAI, RAL, ICRA, IROS

Personal Information

Languages: fluent English, semi-fluent Japanese, native Chinese
Citizenship: Chinese