Lingwei Zhu

curriculum vitae

Project Researcher
Cognitive Developmental Robotics Lab,
International Research Center for Neurointelligence
University of Tokyo, Japan

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personal page

Research Interests

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

Academic Positions

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

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

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

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

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

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

[6] 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.

[7] 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.

[8] 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.

[9] 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.

[10] 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.

[11] 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.

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

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

[14] 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.

[15] 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.

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

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

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

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

[20] 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