

Dake Bu

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RESEARCH INTEREST

Deep Learning Theory; Distribution Optimization; Non-log concave Sampling; Mean-Field Optimization; Reinforcement Learning

WORK EXPERIENCES

Centre for Frontier AI and Research, A*STAR, Research Intern Dec. 2025 – Present

- Working on theoretical research on theoretical foundation of deep learning. PI: [Atsushi Nitanda](#).

RIKEN Center for Advanced Intelligence Project, Research Intern Dec. 2024 – Oct. 2025

- Working on theoretical research as a member of Deep Learning Theory Team. PI: [Taiji Suzuki](#).

EDUCATION BACKGROUND

Department of Computer Science, City University of Hong Kong (CityUHK) Oct. 2023 – Present

Ph.D. | GPA: 3.92/4.0

Major: Computer Science | Supervisors: [Hau-san Wong](#), [Qingfu Zhang](#) Hong Kong SAR

School of Mathematics and Statistics, Xi'an Jiaotong University (XJTU) Aug. 2019 – Jun. 2023

B.Sc. | GPA: 86.62/100

Major: Information and Computational Science | Supervisors: [Hui Li](#), [Jian Sun](#) Xi'an, Shaanxi, PRC

RESEARCH OUTPUTS

- Atsushi Nitanda, **Dake Bu**, Yueming Lyu, Tanya Veeravalli. Slowly Annealed Langevin Dynamics: Theory and Applications to Training-Free Guided Generation.
- Dake Bu**, Wei Huang, Andi Han, Hau-San Wong, Qingfu Zhang, Taiji Suzuki, and Atsushi Nitanda. DPRM: A Plug-in Doob h transform-induced Token-Ordering Module for Diffusion Language Models.
- Dake Bu**, Wei Huang, Andi Han, Atsushi Nitanda, Qingfu Zhang, Hau-San Wong, and Taiji Suzuki. Provable Sample Efficiency of Curriculum Post-Training for Transformer Reasoning (**ICML2026**).
- Dake Bu**, Wei Huang, Andi Han, Atsushi Nitanda, Bo Xue, Qingfu Zhang, Hau-San Wong, and Taiji Suzuki. Post-Training as Reweighting: A Stochastic View of Reasoning Trajectories in Language Models.
- Dake Bu**, Wei Huang, Andi Han, Atsushi Nitanda, Qingfu Zhang, Hau-San Wong, and Taiji Suzuki. Provable In-Context Vector Arithmetic via Retrieving Task Concepts. The 42nd International Conference on Machine Learning (**ICML2025**).
- Bo Xue, **Dake Bu**, Ji Cheng, Yuanyu Wan, Qingfu Zhang. Multi-objective Linear Reinforcement Learning with Lexicographic Rewards. The 42nd International Conference on Machine Learning (**ICML2025**).

7. **Dake Bu**, Wei Huang, Andi Han, Atsushi Nitanda, Taiji Suzuki, Qingfu Zhang, Hau-San Wong: Provably Transformers Harness Multi-Concept Word Semantics for Efficient In-Context Learning. Advances in Neural Information Processing Systems 37 (**NeurIPS 2024**).

8. **Dake Bu**, Wei Huang, Taiji Suzuki, Ji Cheng, Qingfu Zhang, Zhiqiang Xu, Hau-San Wong: Provably Neural Active Learning Succeeds via Prioritizing Perplexing Samples. The 41st International Conference on Machine Learning (**ICML2024**).

HONORARY AWARDS

- Research Tuition Scholarship - CityUHK (Top 5%) 2024-2025
- Outstanding Academic Performance Award for Research Degree Students - CityUHK (Top 10%) 2023-2024
- Postgraduate Studentship - Hong Kong Government (for excellent non-local student) 2023-2025
- Advanced Individual - XJTU (Top 1%) 2021-2022
- School-level Scholarship - XJTU (Top 15%) 2020-2022
- Merit Student - XJTU (Top 20%) 2019-2020

TEACHING EXPERIENCES

- CS3483 Multimodal Interface Design**, Teaching Assistant 2023/24 Semester B
- Held tutorials and graded assignments.
- CS3481 Fundamentals of Data Science**, Teaching Assistant 2024/25 Semester A
- Held tutorials and graded assignments.
- CS3483 Multimodal Interface Design**, Teaching Assistant 2024/25 Semester B
- Held tutorials and graded assignments.
- CS3481 Fundamentals of Data Science**, Teaching Assistant 2025/26 Semester A
- Held tutorials and graded assignments.

SKILLS & ABILITIES

Software Skills: MATLAB, Latex (Tex studio), Pytorch, Microsoft office & WPS, Power Point, Pycharm, Photo Shop, Excel

Programming Skills: Python, Java, C, C++, SQL, HTML, JavaScript, MATLAB.

Language: English: Fluent (TOEFL 109), Japanese: Basic, Mandarin: Native.

Art Skills: Brush Calligraphy (Amateur level 8), Guitar, Board Painting.