

CHENLU YE

University of Illinois Urbana-Champaign
chenluy3@illinois.edu | <https://chenluye99.github.io/>

RESEARCH INTERESTS

- Reinforcement learning from human feedback (RLHF) for aligning large language model;
- Decision-making problems;
- Robust Machine Learning.

EDUCATION

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| University of Illinois Urbana-Champaign Ph.D. student, <i>Computer Science</i> Advisor: Prof. Tong Zhang | <i>Urbana, USA</i> 2024.8 - present |
| The Hong Kong University of Science and Technology MPhil, <i>Artificial Intelligence</i> Advisor: Prof. Tong Zhang and Prof. Yuan Yao | <i>Hong Kong, China</i> 2021.9 - 2024.8 |
| University of Science and Technology of China Bachelor of Science, <i>Statistics</i> | <i>Hefei, China</i> 2017.9 - 2021.6 |

RESEARCH

Self-rewarding correction for mathematical reasoning 2024.12 - 2025.2
University of Illinois Urbana-Champaign
Advisor: Prof. Tong Zhang from UIUC

- We post-trained a single large language model to have the capabilities of self-rewarding and self-correcting simultaneously.
- We formulated the problem as multi-turn mathematical reasoning and combined supervised fine-tuning (SFT) and direct preference learning (DPO) with the self-generated dataset.
- Our approach outperformed intrinsic self-correction and achieved performance comparable to systems with external reward models.

Sharper Rate and Logarithmic Regret Bound for KL-regularized RL 2024.08 - 2025.2
University of Illinois Urbana-Champaign
Advisor: Prof. Tong Zhang from UIUC, Prof. Quanquan Gu from UCLA

- We studies the role of KL-regularization and data coverage for KL-regularized contextual bandits and MDPs.
- We found that the KL constraint leads to a sharper sample complexity, and the sample complexity also enjoys a better coverage dependence on the data-collector policy under an on-policy framework.
- Furthermore, we obtain **logarithmic** bounds with optimistic reward estimation.

Algorithm Designs in Reinforcement Learning from Human Feedback (RLHF) 2023.11 - 2024.8
The Hong Kong University of Science and Technology
Advisor: Prof. Tong Zhang, Prof. Nan Jiang from UIUC

- We formulated the real-world RLHF process as a reverse-KL regularized contextual bandits for preference satisfying Bradley-Terry (BT) model and a the reverse-KL regularized minimax game under general preference, respectively. We studied its theoretical property by proposing statistically efficient algorithms with finite-sample theoretical guarantee.
- We connected our theoretical findings with practical algorithms (e.g. DPO, RSO, iterative IPO), offering new tools and insights for the algorithmic design of alignment algorithms.

Corruption-Robust Reinforcement Learning with General Function Approximation *2022.9 - 2024.2*

University of California, Los Angeles, and The Hong Kong University of Science and Technology

Advisor: Prof. Tong Zhang, Prof. Quanquan Gu from UCLA

- We developed a series of corruption-robust algorithms based on uncertainty weighting for online and offline, value-based and model-based settings.
- We provided theoretical analysis for each algorithm, which enjoy an optimal regret dependence on the corruption level. We implemented the offline algorithm practically under various data-corruption scenarios, which outperforms the state-of-the-art.

Optimal Sample Selection Through Uncertainty Estimation and Its Application in Deep Learning *2020.3 - 2021.8*

HKUST

Advisor: Prof. Tong Zhang, and Prof. Yuan Yao from HKUST

- We proposed a theoretically optimal and computationally efficient sample selection approach.
- We effectively applied it to deep learning and is robust to misspecification (by down-weighting highly uncertain samples).

Provably Efficient Learning in High-Dimensional Batched Bandits *2020.3-2021.7*

USTC

Advisor: Prof. Zhaoran Wang from Northwestern University

- We designed an efficient algorithm for high-dimensional linear contextual bandits with batched feedback.
- Our algorithm enjoyed nearly the same regret order as the sequential case.
- We extended the algorithm to low-rank matrix bandits.

EXPERIENCE

University of California, Los Angeles:

Visiting Research Scholar advised by Prof. Quanquan Gu

2023.8 - 2023.12

The Hong Kong University of Science and Technology:

Teaching Assistant: EMIA 2020 - Cross-disciplinary Design Thinking

Fall 2022

University of Science and Technology of China:

Teaching Assistant: Mathematical Statistics

Fall 2020

Teaching Assistant: Linear Algebra

Spring 2020

HONORS AND AWARDS

Gold Prize for Outstanding Student Scholarship (1/40)

2020.9

Bronze Prize for Outstanding Student Scholarship

2019.9

Bronze Prize for Outstanding Student Scholarship

2018.9

SELECTED PUBLICATIONS AND PREPRINTS

(* denotes alphabetical order or equal contribution)

- [1] Heyang Zhao* Chenlu Ye*, Wei Xiong, Quanquan Gu, Tong Zhang, “Logarithmic Regret for Online KL-Regularized Reinforcement Learning”, [\[Preprint\]](#).
- [2] Chenlu Ye, Yujia Jin, Alekh Agarwal, Tong Zhang, “Catoni Contextual Bandits are Robust to Heavy-tailed Rewards”, [\[Preprint\]](#).
- [3] Heyang Zhao Chenlu Ye, Quanquan Gu, Tong Zhang, “Sharp Analysis for KL-Regularized Contextual Bandits and RLHF”, [\[Preprint\]](#).
- [4] Chenlu Ye*, Wei Xiong*, Yuheng Zhang*, Hanze Dong*, Nan Jiang, Tong Zhang, “Online iterative reinforcement learning from human feedback with general preference model”, [\[NeurIPS 2024\]](#).
- [5] Wei Xiong*, Hanze Dong*, Chenlu Ye*, Han Zhong, Nan Jiang, Tong Zhang, “Iterative preference learning from human feedback: Bridging theory and practice for rlhf under kl-constraint”, [\[ICML 2024\]](#)
- [6] Chenlu Ye*, Jiafan He*, Quanquan Gu, Tong Zhang, “Towards robust model-based reinforcement learning against adversarial corruption”, [\[ICML 2024\]](#).
- [7] Chenlu Ye*, Rui Yang*, Quanquan Gu and Tong Zhang, “Corruption-Robust Offline Reinforcement Learning with General Function Approximation”, [\[NeurIPS 2023\]](#).
- [8] Yong Lin*, Chen Liu*, Chenlu Ye*, Qing Lian, Yuan Yao and Tong Zhang, “Optimal Sample Selection Through Uncertainty Estimation and Its Application in Deep Learning”, [\[Preprint\]](#).
- [9] Chenlu Ye, Wei Xiong, Quanquan Gu, and Tong Zhang, “Corruption-Robust Algorithms with Uncertainty Weighting for Nonlinear Contextual Bandits and Markov Decision Processes”, [\[ICML 2023\]](#).
- [10] Jianqing Fan*, Zhaoran Wang*, Zhuoran Yang*, Chenlu Ye*, “Provably Efficient High-Dimensional Bandit Learning with Batched Feedbacks”, [\[Preprint\]](#).

PROFESSIONAL ACTIVITY

Conference Reviewer: ICML, NeurIPS, ICLR, AISTAT.

Journal Reviewer: Machine Learning, Artificial Intelligence.