

Zhengyao Gu

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Google Scholar | LinkedIn

EDUCATION

University of Illinois Chicago , Chicago, IL	Aug. 2024 — Present
Ph.D. in Computer Science	GPA: 4.00/4.00
<i>Advisor: Prof. Philip S. Yu</i>	
New York University, Center for Data Science , New York, NY	Sep. 2022 — May 2024
Master of Science in Data Science	GPA: 3.96/4.00
<i>Advisor: Prof. Kyunghyun Cho</i>	
Reed College , Portland, OR	Aug. 2017 — May 2021
Bachelor of Arts in Computer Science & Mathematics	GPA: 3.74/4.00

RESEARCH INTERESTS | SKILLS

- RL for Post-Training, Reinforcement Learning, Test-Time Search Methods (Planning)
- `verl`, `Ray`, `modin`, `pytorch`
- `python`, `C++`

Pre-Prints

- **Zhengyao Gu***, Jonathan Light*, B Raul Astudillo, Ziyu Ye, Langzhou He, Henry Peng Zou, Wei Cheng, Santiago Paternain, Philip S. Yu, Yisong Yue. “**ACTOR-CURATOR: Co-adaptive Curriculum Learning via Policy-Improvement Bandits for Scalable RL Post-Training.**” <https://arxiv.org/abs/2602.20532v1>, 2026.
 - Formulated adaptive training data selection for LLM RL post-training as a non-stationary stochastic bandit problem. Proposed a neural function-approximation variant of online stochastic mirror descent (OSMD) for curator optimization, paired with a learning signal derived from the performance difference lemma to directly target expected policy improvement. Achieves up to **30.5% gain on ARC-1D, 28.6% on AIME2024, and 80% faster convergence over the strongest baselines.**

PUBLICATIONS

- **Zhengyao Gu**, Henry Peng Zou, Yankai Chen, Aiwei Liu, Weizhi Zhang, Philip S Yu. **Scaling Laws for Many-Shot In-Context Learning with Self-Generated Annotations.** (*LCFM@ICML 2025*)
 - Discover a scaling law for In-context learning performance with thousands of self-generated pseudo-demonstrations. Propose an iterative refinement method that achieves a further 6.8% improvement by progressively enhancing pseudo-annotation quality
- Henry Peng Zou, **Zhengyao Gu**, Yue Zhou, Yankai Chen, Weizhi Zhang, Liancheng Fang, Yibo Wang, Yangning Li, Kay Liu, Philip S Yu. **TestNUC: Enhancing Test-Time Computing Approaches through Neighboring Unlabeled Data Consistency.** (*ACL 2025*)
 - Introduces a linearly scaling approach that improves test-time predictions by leveraging the local consistency of neighboring unlabeled data, improving performance on benchmark by 9.64%.
- **Zhengyao Gu**, Diego T. Lopez, Lilas Alrahis and Ozgur Sinanoglu, **Always be Pre-Training: Representation Learning for Network Intrusion Detection with GNNs.** *International Symposium on Quality Electronic Design (ISQED) 2024*
 - Propose pre-training the GNNs using the same data as the downstream supervised learning task, demonstrating increased data efficiency, achieving over 98% of the performance of the supervised state-of-the-art with less than 4% of the data. labeled data
- **Zhengyao Gu** and Mark Hopkins. 2023. **On the Evaluation of Neural Selective Prediction Methods for Natural Language Processing.** (*ACL 2023*)
 - Introduce a novel metric called refinement that provides a calibrated evaluation of confidence functions for selective prediction. We provide a survey and empirical comparison of the state-of-the-art in neural selective classification for NLP tasks and show the brittleness of previous claims.

PROFESSIONAL EXPERIENCES

Pre-Training User Behavior Foundation Model

Data Scientist, WeightWatchers Inc.

New York, NY

Jun. 2023 — Aug. 2023

- Train the company's **first** Foundation Model (3B), using distributed ML frameworks (ray, modin, and more), from user activity sequences (user actions as tokens) in the WeightWatchers mobile apps.
- Develop, with a platform engineer, the infrastructure needed for LLM training: **data extraction** from SnowFlake SQL, **distributed data pre-processing** via **modin**, **distributed data ingest** via **ray data**, **distributed training** via **ray train**.
- Experiment with different paradigms of LLM such as full-attention LLMs (BERT), data efficient LLMs (ELECTRA), and xFormers (BigBird, LongFormers)
- Demonstrate the LLM's ability to generate novel insights for the Product Analytics team

Empathic Sentiment Classifier

Research Scientist, TalkMeUp, Inc.

Pittsburgh, PA

May 2021 — Sep. 2021

- Develop a classifier predicting whether the communicator's utterance matches an empathic baseline.
- Employ Domain-Adaptive Pre-Training to improve the performance of the classifier with scarce labeled data (less than 1000 labeled samples) by 44%..

TEACHING

Teaching Assistant, University of Illinois Chicago

Aug. 2024 — Present

- Discrete Mathematics, Data Structures, Graduate-Level Algorithms

SERVICES

Reviewer, ICML 2026

Reviewer, ICLR 2026

Reviewer, ACL Rolling Review