

Yuchen Li

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EDUCATION

Carnegie Mellon University

August 2020 - May 2025 (expected)

- Ph.D. student in Machine Learning, advised by Prof. Andrej Risteski Pittsburgh, PA
- Research interests: machine learning, natural language processing, and data mining GPA: 4.24/4.33
- I currently work on (1) improving mathematical understanding of how neural network models (e.g. transformers) process language, and (2) developing principled approaches to self-supervised learning

University of Illinois at Urbana-Champaign

August 2015 - May 2019

- B.S. Statistics and Computer Science; second major in Mathematics; minor in Electrical Engineering Urbana-Champaign, IL
- Research mentors: Prof. Jiawei Han, Prof. AJ Hildebrand, Prof. Pramod Viswanath GPA: 4.0/4.0
- Summa Cum Laude; Highest Distinction in both majors
- Bronze Tablet Scholar: top 3% in the graduating class
- John R. Pasta Outstanding Undergraduate Award 2018: 2 out of about 400 computer science undergraduate junior students

WORK

Research Intern, ByteDance Ltd. (parent company of TikTok)

May 2022 - August 2022

- Working on a research project about machine translation at the ByteDance AI Lab Remote, United States
- Investigating the effect of language similarity in machine learning models for multi-lingual translation

Machine Learning Engineer, Quora, Inc.

August 2019 - August 2020

- Developed neural network models for predicting ads clickthrough rate Mountain View, CA
- Led team-wide initiative of improving system robustness and reducing on-call burden in the Ads Ranking team
- Developed features for modeling the ads and the users
- Improved backend for cost-efficient low-latency online serving of machine learning models
- Launched online A/B testing to compare different model variants based on a set of key business metrics

Software Engineer Intern, Facebook, Inc.

May 2018 - August 2018

- Designed and implemented a platform for investigating machine learning feature importance Menlo Park, CA
- Proposed and developed feature perturbation and statistical analysis methods

PUBLICATIONS

(* indicates equal contribution or alphabetical order)

1. **Yuchen Li**, Yuanzhi Li, Andrej Risteski. *How Do Transformers Learn Topic Structure: Towards a Mechanistic Understanding*. arXiv <https://arxiv.org/abs/2303.04245>. 2023.
2. Ashwini Pokle *, Jinjin Tian *, **Yuchen Li** *, Andrej Risteski. *Contrasting the landscape of contrastive and non-contrastive learning*. Conference on Artificial Intelligence and Statistics (AISTATS) 2022.
3. **Yuchen Li**, Andrej Risteski. *The Limitations of Limited Context for Constituency Parsing*. Association for Computational Linguistics (ACL) 2021.
4. Xinwei He *, A.J. Hildebrand *, **Yuchen Li** *, Yunyi Zhang *. *Complexity of Leading Digit Sequences*. Journal of Discrete Mathematics & Theoretical Computer Science, vol. 22 no. 1, Automata, Logic and Semantics 2020.

5. Yu Shi *, Jiaming Shen *, **Yuchen Li**, Naijing Zhang, Xinwei He, Zhengzhi Lou, Qi Zhu, Matthew Walker, Myunghwan Kim and Jiawei Han. *Discovering Hypernymy in Text-Rich Heterogeneous Information Network by Exploiting Context Granularity*. Conference on Information and Knowledge Management (CIKM) 2019.
6. Hongyu Gong, **Yuchen Li**, Suma Bhat and Pramod Viswanath. *Context-Sensitive Malicious Spelling Error Correction*. The Web Conference (WWW) 2019.
7. **Yuchen Li** *, Zhengzhi Lou *, Yu Shi, and Jiawei Han. *Temporal Motifs in Heterogeneous Information Networks*. In Proceedings of the 14th International Workshop on Mining and Learning with Graphs (MLG) 2018.

TALKS

The Limitations of Limited Context for Constituency Parsing

- Association for Computational Linguistics (ACL) Conference Virtual, August 2021
- NEC Laboratories Europe Virtual, July 2021
- Approximately Correct Machine Intelligence (ACMI) Lab, CMU Virtual, June 2021

TEACHING

Teaching Assistant, Advanced Introduction to Machine Learning

August 2022 - December 2022

- Taught one recitation session on optimization Pittsburgh, PA
- Held weekly office hours; created and graded homework problems

Teaching Assistant, Probabilistic Graphical Models

January 2022 - May 2022

- Taught two recitation sessions (about algorithmic reduction and causality, respectively) Pittsburgh, PA
- Mentored nine teams of student projects (topics include natural language processing, information retrieval, 3D computer vision, and causality)
- Held weekly office hours; created and graded homework and quiz problems

Volunteer Teaching Assistant, Data Science Bootcamp

May 2019

- Contributed to creating a Python tutorial focusing on NumPy and Matplotlib libraries. Urbana, IL
- Helped in the class section for about 20 math graduate students and answered their programming questions

Member, Eta Kappa Nu (HKN) Honors Society Alpha Chapter at UIUC

August 2016 - May 2019

- Contributed to its educational website Weber's Wiki Urbana, IL
- Developed and taught two Analog Signal Processing midterm review sessions, each with about 40 students attending

SERVICE

Reviewer, Academic Research Conferences

- International Conference on Learning Representations (ICLR) 2023
- Artificial Intelligence and Statistics (AISTATS) 2022
- Neural Information Processing Systems (NeurIPS) 2021

Member, CMU Machine Learning Admitted PhD Student Open House Committee

2022

- Planned and organized information sessions and social events for admitted PhD students Pittsburgh, PA

Mentor, CMU Computer Science Graduate Application Support Program

November 2020

- Connected with potential applicants, particularly those from underrepresented groups Pittsburgh, PA
- Offered feedbacks on their application materials and answered their questions related to graduate school application

SKILLS

- Proficient in *Python, PyTorch, TensorFlow, C, SQL, MATLAB, PHP*; intermediate in *C++, R, Haskell*; basic in *Java, JavaScript*