Yiwei Lyu

(484)387-0457 | yiweilyu@umich.edu | [Google Scholar](#) | [LinkedIn](#) | [Personal Webpage](#)

Short Biography

I am currently a Ph.D. student in Computer Science and Engineering at University of Michigan, co-advised by Dr. Honglak Lee and Dr. Todd Hollon. Previously I received a B.S. in Computer Science and a M.S. in Machine Learning at Carnegie Mellon University, where I was advised by Dr. Louis-Philippe Morency.

My research interests are in machine learning that are applicable to the real world, including multimodal machine learning, computer vision and natural language processing. I have spent three summers doing research, supported by CMU Summer Undergraduate Research Apprenticeship (2018), Summer Undergraduate Research Fellowship (2020), and Research Intern at CMU MultiComp Lab (2021), and have worked as an undergraduate/graduate research assistant at CMU SquaresLab and CMU MultiComp Lab. I have also been a software engineer intern at Pinterest in the summer of 2019.

I received Honorable Mention for the 2021 CRA Outstanding Undergraduate Research Award, and I ranked top 200 in William Lowell Putnam Mathematical Competition (the most prestigious college math competition in North America) in 2017 and 2018.

Research Interests

- Multimodal Machine Learning
- Computer Vision
- Natural Language Processing
- Healthcare applications of all of the above

Education

- (In Progress) Ph.D. in Computer Science and Engineering, University of Michigan, Ann Arbor, MI
  Ann Arbor MI, 2022-2027 (expected)
  Advisors: Dr. Honglak Lee, Dr. Todd Hollon
- M.S. in Machine Learning, Carnegie Mellon University, Pittsburgh, PA
  Pittsburgh PA, 2021-2022
  Research Advisor: Dr. Louis-Philippe Morency
- B.S. in Computer Science, Carnegie Mellon University, Pittsburgh, PA
  Pittsburgh PA, 2017-2021
  Minors in Mathematics and Machine Learning
  Graduated with University Honors
  Honors Senior Thesis: Towards Fine-grained Controllable Text Style Transfer (Spring 2021)
  Undergraduate Researcher with Paul Liang and Dr. Louis-Philippe Morency, MultiComp Lab (2020-2021)
  Undergraduate Researcher with Dr. Claire Le Goues, SquaresLab (2018-2020)
  Undergraduate Researcher with Dr. Guillaume Sartoretti, BioRobotics Lab (2017-2018)

Peer-Reviewed Publications

- [Fine-grained Text Style Transfer with Diffusion-Based Language Models](#)
  Yiwei Lyu, Tiange Luo, Jiacheng Shi, Todd C. Hollon, Honglak Lee
  ACL 2023 Repl4NLP Workshop, **Best Paper Award** [code]
- [Nano: Nested Human-in-the-Loop Reward Learning for Few-shot Language Model Control](#)
  Xiang Fan, **Yiwei Lyu**, Paul Pu Liang, Ruslan Salakhutdinov, Louis-Philippe Morency
  ACL 2023 Findings [code]
- [High-Modality Multimodal Transformer: Quantifying Modality & Interaction Heterogeneity for High-Modality Representation Learning](#)

Paul Pu Liang, **Yiwei Lyu**, Xiang Fan, Jeffrey Tsaw, Yudong Liu, Shentong Mo, Dani Yogatama, Louis-Philippe Morency, Russ Salakhutdinov

TMLR [code]

- MULTIVIZ: Towards Visualizing and Understanding Multimodal Models

  Paul Pu Liang, **Yiwei Lyu**, Gunjan Chhablani, Nihal Jain, Zihao Deng, Xingbo Wang, Louis-Philippe Morency, Ruslan Salakhutdinov

  ICLR 2023 [website] [code]

- DIME: Fine-grained Interpretations of Multimodal Models via Disentangled Local Explanations

  Yiwei Lyu, Paul Pu Liang, Zihao Deng, Ruslan Salakhutdinov, Louis-Philippe Morency

  AIES 2022 [code]

- MultiBench: Multiscale Benchmarks for Multimodal Representation Learning

  Paul Pu Liang, **Yiwei Lyu**, Xiang Fan, Zetian Wu, Yun Cheng, Jason Wu, Leslie Chen, Peter Wu, Michelle A. Lee, Yuke Zhu, Ruslan Salakhutdinov, Louis-Philippe Morency

  NeurIPS 2021 Datasets and Benchmarks Track [website] [code]

- StylePTB: A Compositional Benchmark for Fine-grained Controllable Text Style Transfer

  Yiwei Lyu*, Paul Pu Liang*, Hai Pham*, Eduard Hovy, Barnabás Póczos, Ruslan Salakhutdinov, Louis-Philippe Morency

  NAACL 2021 [code]

- Leveraging program invariants to promote population diversity in search-based automatic program repair

  Zhen Yu Ding*, **Yiwei Lyu***, Christopher S. Timperley, Claire Le Goues

  ICSE 2019, International Workshop on Genetic Improvement [code]

Fellowships, Honors, Awards
- **Best Paper Award** at Repl4NLP workshop at ACL 2023
- **CRA Outstanding Undergraduate Research Award Honorable Mention, 2021**
- CMU School of Computer Science University Honors, 2021
- Summer Undergraduate Research Fellowship, 2020
- CMU School of Computer Science Dean's List, 2017-2020
- William Lowell Putnam Mathematical Competition rank 193 in North America, 2018
- William Lowell Putnam Mathematical Competition **rank 107 in North America, 2017**
- Virginia Tech Regional Mathematics Contest top 20 of 700+, 2017

Teaching
- Teaching Assistant for CMU 15-210 (Parallel and Sequential Data Structure and Algorithms)
  - Spring 2019 (Taught by Dr. Umut Acar and Dr. Daniel Sleator)
  - Fall 2019 (Taught by Dr. Charlie Garrod and Dr. Guy Blelloch)
  - Spring 2020 (Taught by Dr. Umut Acar and Dr. Marijn Heule)
  - Fall 2020 (Taught by Dr. Charlie Garrod and Dr. Guy Blelloch)

Internships
- Research Intern, MultiComp Lab, Carnegie Mellon University (Summer 2021, Pittsburgh, PA)
  Advisors: Paul Liang, Dr. Louis-Philippe Morency
- Software Engineer Intern, Pinterest (Summer 2019, San Francisco, CA)

Academic Professional Service:
- Artificial Social Intelligence Workshop at ICCV 2023: PC member / Reviewer
- NeurIPS 2023 Dataset and Benchmark Track: Reviewer

- NeurIPS 2023: Reviewer
- ICCV 2023: Reviewer
- CVPR 2023: Reviewer
- Future Generation Computer Systems (FGCS journal): Reviewer
- ICDM 2022 FOMO-VL Workshop: Reviewer
- NeurIPS 2022 Dataset and Benchmark Track: Reviewer
- ICML 2022: Reviewer
- Multimodal Artificial Intelligence Workshop at NAACL 2021: PC member / Reviewer

Selected Coursework (at Carnegie Mellon University)
- 10-725 Convex Optimization (Spring 2022) by Dr. Yuanzhi Li
- 10-745 Scalability in Machine Learning (Spring 2022) by Dr. Barnabas Poczos
- 10-708 Probabilistic Graphical Models (Fall 2021) by Dr. Pradeep Ravikumar
- 36-705 Intermediate Statistical Theory (Fall 2021) by Dr. Sivaraman Balakrishnan
- 21-356 Real Analysis II (Spring 2020) by Dr. Giorgos Chasapis
- 15-440 Distributed Systems (Spring 2020) by Dr. Mahadev Satyanarayanan
- 11-777 Advanced Multimodal Machine Learning (Fall 2020) by Dr. Louis-Philippe Morency
- 10-703 Deep Reinforcement Learning and Control (Fall 2020) by Dr. Katerina Fragkiadaki
- 11-411 Natural Language Processing (Spring 2020) by Dr. Alan Black and Dr. David Mortensen
- 10-707 Advanced Deep Learning (Spring 2020) by Dr. Andrej Risteski
- 17-355 Program Analysis (Spring 2020) by Dr. Claire Le Goues
- 21-484 Graph Theory (Spring 2020) by Dr. John Mackey
- 36-401 Modern Regression (Fall 2019) by Dr. Edward Kennedy
- 15-451 Algorithm Design and Analysis (Fall 2019) by Dr. Daniel Sleator and Dr. Gary Miller
- 15-312 Foundations of Programming Languages (Fall 2019) by Dr. Robert Harper
- 10-701 Introduction to Machine Learning (Spring 2019) by Dr. Leila Wehbe

Volunteering
- Western PA ARML Team Coach (2021-2022)

Skills
- Languages: English (fluent), Chinese (native)
- Programming Languages: Python, Java, C, C++
- Software: PyTorch, TensorFlow, Keras, Latex, MySQL
- Experience in using AWS and Amazon Mechanical Turk