Bingbin Liu | Curriculum Vitae

✉ bingbinl@cs.cmu.edu • 🌐 clarabing.github.io

Education

○ **Carnegie Mellon University**   *2019 – present*
Ph.D. in Machine Learning advised by Andrej Risteski and Pradeep Ravikumar.

○ **Stanford University**   *2017 – 2019*
M.S. in Computer Science advised by Fei-Fei Li.

○ **The University of Hong Kong**   *2013 – 2017*
B.Eng. CS Major & Math Minor, First-Class Honour.

Publications and Preprints

○ **TinyGSM: achieving $> 80\%$ on GSM8k with small language models**
preprint [link]
Bingbin Liu, Sebastien Bubeck, Ronen Eldan, Janardhan Kulkarni, Yuanzhi Li, Anh Nguyen, Rachel Ward, Yi Zhang

○ **Understanding Augmentation-based Self-Supervised Representation Learning via RKHS Approximation**
*ICLR 2024 (**Spotlight**)* [link]
Runtian Zhai, Bingbin Liu, Andrej Risteski, Zico Kolter, Pradeep Ravikumar

○ **Exposing Attention Glitches with Flip-Flop Language Modeling**
*NeurIPS 2023 (**Spotlight**)* [link]
Bingbin Liu, Jordan T. Ash, Surbhi Goel, Akshay Krishnamurthy, Cyril Zhang

○ **Transformers are uninterpretable with myopic methods: a case study with bounded Dyck grammars**
NeurIPS 2023 [link]
Kaiyue Wen, Yuchen Li, Bingbin Liu, Andrej Risteski

○ **Transformers Learn Shortcuts to Automata**
*ICLR 2023 (**Oral**)* [link]
Bingbin Liu, Jordan T. Ash, Surbhi Goel, Akshay Krishnamurthy, Cyril Zhang

○ **Masked prediction tasks: a parameter identifiability view**
NeurIPS 2022 [link]
Bingbin Liu, Daniel Hsu, Pradeep Ravikumar, Andrej Risteski

○ **Analyzing and Improving the Optimization Landscape of Noise-Contrastive Estimation**
*ICLR 2022 (**Spotlight**)* [link]
Bingbin Liu, Elan Rosenfeld, Pradeep Ravikumar, Andrej Risteski

○ **Contrastive learning of strong-mixing continuous-time stochastic processes**
AISTATS 2021; abstract version presented at the WiML workshop colocated with NeurIPS 2020.[link]
Bingbin Liu, Pradeep Ravikumar, Andrej Risteski

○ **Generalized Boosting**
NeurIPS 2020 [link]
Arun Sai Suggala, Bingbin Liu, Pradeep Ravikumar

○ **Spatiotemporal Relationship Reasoning for Pedestrian Intent Prediction**
ICRA 2020, IEEE-RAL [link].
Bingbin Liu, Ehsan Adeli, Zhangjie Cao, Kuan-Hui Lee, Abhijeet Shenoi, Adrien Gaidon, Juan Carlos Niebles

○ **A Computer Vision System for Deep Learning-based Detection of Patient Mobilization Activities in the ICU**
Nature Digital Medicine 2019 [link]
Serena Yeung*, Francesca Rinaldo*, Jeffrey Jopling, Bingbin Liu, Rishab Mehra, Lance Downing, Michelle Guo, Gabriel Bianconi, Alexandre Alahi, Julia Lee, Brandi Campbell, Kayla Deru, William Beninati, Li Fei-Fei, Arnold Milstein

- **Learning to Decompose and Disentangle Representations for Video Prediction**
  NeurIPS18 [link]
  Jun-Ting Hsieh, Bingbin Liu, De-An Huang, Li Fei-Fei, Juan Carlos Niebles

- **Temporal Modular Networks for Retrieving Complex Compositional Activities in Videos**
  ECCV18 [link]. Also presented at WiCV 2018.
  Bingbin Liu, Serena Yeung, Edward Chou, De-An Huang, Li Fei-Fei, Juan Carlos Niebles

- **3D Point Cloud-Based Visual Prediction of ICU Mobility Care Activities**
  MLHC18 [link]
  Bingbin Liu*, Michelle Guo*, Edward Chou, Rishab Mehra, Serena Yeung, N. Lance Downing, Francesca Rinaldo, Jeffrey Jopling, Branci Campbell, Kayla Deru, William Beninati, Arnold Milstein, Li Fei-Fei

- **Descriptive Analysis of ICU Patient Mobilization from Depth Videos**
  ML4H 2018 (colocated with NeurIPS 18)
  Laëtitia Shao*, Zaid Nabulsi*, Ruchir Rastogi*, Bingbin Liu, Francesca Rinaldo, Serena Yeung, N. Lance Downing, William Beninati, Arnold Milstein, Li Fei-Fei

Research Experience

- **Microsoft Research Lab – Redmond** *Summer 2023*
  Mentored by Yi Zhang, Yuanzhi Li, Rachel Ward, Ronen Eldan, Sébastien Bubeck.

- **Microsoft Research Lab – New York City** *Summer 2022*
  Mentored by Cyril Zhang, Akshay Krishnamurthy, Surbhi Goel, Jordan T. Ash.
  Transformers for algorithmic reasoning tasks defined with finite-state automata.

- **Stanford Vision and Learning Lab** *Stanford University, 2017 – 2019*
  Advised by Fei-Fei Li and Juan Carlos Niebles.
  Compositional video understanding with graphs, temporal modules, and disentangled representations.

- **Partnership in AI Assisted Care (PAC)** *Stanford University, 2017 – 2019*
  Advised by Fei-Fei Li, Arnold Milstein, Serena Yeung.
  Student lead of the ICU team: using depth videos to monitor and document patient mobilization levels in ICU care.

- **HKU Computer Vision Lab** *The University of Hong Kong, 2016 – 2017*
  Advised by Kenneth K.Y. Wong.
  Final year project: improving video object recognition with temporal context using a T-CNN based framework.

- **UCSB Programming Language Lab** *UC Santa Barbara, Feb – June 2016*
  Advised by Ben Hardekopf.
  Undergraduate study: building a compiler in Haskell of a functional ISA for simplified formal verifications.

Teaching Experience

- **Graduate Teaching Assistant** *Carnegie Mellon University*

  - 10716 - Advanced Machine Learning, Spring 2022
  - 10707 - Advanced Deep Learning, Spring 2021

- **Graduate Teaching Assistant** *Stanford University*

  - CS231N - Convolutional Neural Networks for Visual Recognition, Spring 2018, Spring 2019.
  - MED277/CS337 - AI-Assisted Health Care, Fall 2018, Winter 2019.

Work Experience

- **Group IT Intern at CLP Power Hong Kong Limited** *Hong Kong, Summer 2016*
  Enterprise and Analytics Team: data analysis to enhance services at the help desk and critical systems.
- **Software Engineering Intern at Hututa Technologies Limited** *Hong Kong, Summer 2015*
  Test and development of a system for efficient big data processing.

Services and Other Experience

- **Organizing**
  Organizier of the Mathematics of Modern Machine Learning (M3L) workshop at NeurIPS 2023.
- **Reviewing**
  Reviewer for ICLR, ICML, NeurIPS (top 8% reviewer at NeurIPS 2022), AISTATS.
- **Doctoral Review Committee** *Carnegie Mellon University, 2020 – 2023*
  DRC member of the Machine Learning Department.
- **CMU AI Undergraduate Mentoring Program** *Carnegie Mellon University, 2020, 2023*
  Graduate student mentor for undergraduates from underrepresented groups.
- **AI4ALL** *Stanford University, Summer 2018*
  Research mentor of the NLP team. [website]
- **Girls teach Girls to Code** *Stanford University, Spring 2018*
  Mentor lead for the AI track. [website]
- **HKU Buddy Program** *The University of Hong Kong, 2014 - 2017*
  Buddy mentor for Engineering freshmen and exchange students.
- **HKU Student Ambassador** *The University of Hong Kong, 2014 - 2015*
  Student helper at admission talks and the information day.

Awards

- **Tang Family Presidential Fellowship** *2023*
- **Powering a Sustainable Generation Scholarship by CLP** *2015*
- **HKU World Wide Scholarship** *2015*
- **Dean's Honours List** *2013 - 2017*
- **Lee Shau Kee Scholarships** *2013 - 2017*