

Bingbin Liu | Curriculum Vitae

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Education

- **Carnegie Mellon University** 2019 – present
Ph.D. in Machine Learning advised by [Pradeep Ravikumar](#) and [Andrej Risteski](#).
- **Stanford University** 2017 – 2019
M.S. in Computer Science
- **The University of Hong Kong** 2013 – 2017
B.Eng. CS Major & Math Minor, First-Class Honour

Publications and Preprints

- **Transformers Learn Shortcuts to Automata**
Preprint [[link](#)]
[Bingbin Liu](#), Jordan T. Ash, Surbhi Goel, Akshay Krishnamurthy, Cyril Zhang
- **Masked prediction tasks: a parameter identifiability view**
NeurIPS22 [[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 Sheno, Adrien Gaidon, Juan Carlos Nibbles
- **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 Nibbles
- **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 Nibbles
- **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, Brandi 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 – 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.

Other Experience

- **Doctoral Review Committee** *Carnegie Mellon University, 2020 – present*
DRC member of the Machine Learning Department.
- **CMU AI Undergraduate Mentoring Program** *Carnegie Mellon University, 2020*
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.