

# Shichao Xu

Address: Tech Room L476, 2145 Sheridan Road, Evanston, Illinois 60208, United States

Email: shichaoxu2023@u.northwestern.edu

Homepage: <https://shichao.netlify.app/> • linkedin: [linkedin.com/in/shichao-xu-6a0584214/](https://www.linkedin.com/in/shichao-xu-6a0584214/)

## OBJECTIVE

- I am looking for a full-time research scientist position.

## ABOUT ME

- I am a final-year Ph.D. candidate in the Computer Science Department at Northwestern University, and my advisor is Prof. Qi Zhu. I also work collaboratively with Prof. Zhaoran Wang from Northwestern University, Prof. Zheng O'Neill from Texas A&M, and Prof. Yanzhi Wang from Northeastern University. I received my undergraduate degree from Shanghai Jiao Tong University (ACM Class). In this year, I work as a research intern in OPPO and then have the internship in Google research from the fall quarter.

## RESEARCH INTERESTS

- My current research interests mainly focus on **Learning from Limited or Imperfect Data**, especially for dealing with the problem of **data insufficiency**, and **imperfect data quality**. The related topics include **deep representation learning**, **domain adaptation**, **self/weakly/semi-supervised learning**, **transfer learning**, and **reinforcement learning** with application to vision, multi-modal, and control problems. My recent project is related to **vision-language pre-training (VLP)** and **zero-shot multi-label classification**, and we have achieved state-of-the-art performance on both multi-label classification and zero-shot multi-label classification tasks.

## PROGRAMMING SKILLS

C, C++, Python, HTML, Shell, PyTorch, TensorFlow

## EDUCATION

**Northwestern University**, Evanston, Illinois, USA

- Ph.D. in Computer Science Sep 2018 – Jun 2023
  - Adviser: Prof. Qi Zhu
  - Cumulative GPA: 3.9 / 4.0
- M.S. in Computer Science Sep 2018 – Jun 2021
  - Cumulative GPA: 3.9 / 4.0

**Cornell University**, Ithaca, New York, USA

- Summer school Jun 2017 – Jul 2017
  - Invited by Prof. Elaine Shi • Take courses and talks, work with Prof. Carla Gomes

**Shanghai Jiao Tong University**, Shanghai, China

- B.S. in Computer Science Sep 2014 – Jul 2018
  - ACM Class alumnin, Cumulative GPA: 3.9 / 4.3
  - Adviser: Prof. Liqing Zhang

## WORK EXPERIENCE

**Google Research**, Los Angeles, California, USA

- Research Intern, Ads Group Sep 2022 – Dec 2022
  - Develop method for learning from data with label noise on Threephil Taxonomic model, which improves the overall model performance.
  - Explore potential approaches for data imbalance in Taxonomic model, aiming to get improvements on minor classes.
  - Supervisors: Fangcheng Sun, Pietro Kreitlon Carolino

**OPPO Research**, Palo Alto, California, USA

- Research Intern, Video Group May 2022 – Aug 2022
  - Lead the research project on image searching, which is related to (zero-shot) multi-label image classification and vision-language pre-training (VLP).
  - We have achieved much better results than previous state-of-the-art method on multi-label image classification and zero-shot multi-label image classification.
  - Working on joint video moment retrieval and highlight detection.
  - Supervisors: Jen-Hao Hsiao

**Northwestern University**, Evanston, Illinois, USA

- Research Assistant, IDEAS Lab Sep 2018 – present
  - Conducting the research of learning from limited/imperfect data on vision and control tasks, with 7+ publications as the first author (including the ICCV paper weak adaptation learning, and the ICLR oral paper Non-transferable learning.), and also collaborated with other researchers and groups on 10+ publications.
  - Large DoE Project: Securing Grid-interactive Efficient Buildings (GEB) through Cyber Defense and Resilient System
    - The main contributor to the tasks on Northwestern University side, mainly on researching and developing the efficient model-free deep reinforcement learning-based HVAC controllers and also the sensor fault-tolerant HVAC controllers.
  - Supervisors: Prof. Qi Zhu
- Teaching Assistant, Computer Science Department Sep 2021 – Jan 2022

- CS 213: Introduction to Computer Systems

#### Microsoft Research Asia, Beijing, China

- Research Intern, Visual Computing Group Aug 2017 – Jan 2018
  - Conduct research on object detection and eliminate the learning bias from pre-train models, also work on neural architecture search for object detection.
  - Supervisors: Jifeng Dai

#### Shanghai Jiao Tong University, Shanghai, China

- Research Assistant, Center for Brain-like Computing and Machine Intelligence Jun 2015 – Jul 2018
  - Working on the topic of video semantic segmentation and small object detection.
  - Supervisors: Prof. Liqing Zhang
- Teaching Assistant, Zhiyuan College Sep 2016 – Jul 2017
  - Compiler Design and Implementation (MS208, Spring 2017)

## PUBLICATIONS

### AS FIRST/CO-FIRST AUTHOR

Shichao Xu, Yikang Li, Qi Zhu, Jen Hao Hsiao “Multi-Label Classification with Dual-Modal Decoder on Aligned Visual-Textual Features,” **State-of-the-art on Multi-Label Classification and Zero-shot Multi-Label Classification**, Under review, 2022.

Shichao Xu, Yangyang Fu, Yixuan Wang, Zhuoran Yang, Zheng O’Neill, Zhaoran Wang and Qi Zhu “Accelerate Online Reinforcement Learning for Building HVAC Control with Heterogeneous Expert Guidances”, *The 8th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys ’22)*. Invited to Nature Scientific Reports.

Shichao Xu\*, Lixu Wang\*, Ruiqi Xu, Xiao Wang, and Qi Zhu “Non-Transferable Learning: A New Approach for Model Verification and Authorization,” *International Conference on Learning Representations (ICLR)*, **Oral**, 2022.

Shichao Xu, Yangyang Fu, Yixuan Wang, Zheng O’Neill, and Qi Zhu “Model-assisted Learning-based Framework for Sensor Fault-Tolerant Building HVAC Control,” *The 8th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys ’21)*, Coimbra, Portugal (acceptance ratio = 26%), 2021.

Shichao Xu\*, Lixu Wang\*, Yixuan Wang, and Qi Zhu “Weak Adaptation Learning–Addressing Cross-domain Data Insufficiency with Weak Annotator,” *IEEE/CVF International Conference on Computer Vision (ICCV)*, 2021.

Shichao Xu, Yixuan Wang, Yanzhi Wang, Zheng O’Neill, and Qi Zhu “One for Many: Transfer Learning for Building HVAC Control,” *In Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation, (BuildSys ’20)*, 2020.

Shichao Xu, Shuyue Lan, and Zhu Qi “MaskPlus: Improving Mask Generation for Instance Segmentation,” *The IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2020.

### OTHER SELECTED COLLABORATIONS

Jiahua Dong, Lixu Wang, Zhen Fang, Gan Sun, Shichao Xu, Xiao Wang, and Qi Zhu “Federated Class-Incremental Learning,” *IEEE/CVF Conference on CVPR*, 2022.

Lixu Wang, Shichao Xu, Xiao Wang, and Qi Zhu “Towards Class Imbalance in Federated Learning,” *In 35th Conference on Artificial Intelligence (AAAI)*, 2021.

Yixuan Wang, Chao Huang, Zhilu Wang, Shichao Xu, Zhaoran Wang, Qi Zhu “Cocktail: Learn a Better Neural Network Controller from Multiple Experts via Adaptive Mixing and Robust Distillation,” *58th ACM/IEEE Design Automation Conference (DAC)*, 2021.

Chao Huang, Shichao Xu, Zhilu Wang, Shuyue Lan, Wenchao Li, and Qi Zhu “Opportunistic Intermittent Control with Safety Guarantees for Autonomous Systems,” *57th ACM/IEEE Design Automation Conference (DAC)*, San Francisco, CA, USA, 2020.

More collaboration works can be found [here]

## AWARDS & SCHOLARSHIPS

- Terminal Year Fellowship from Richter Memorial Fund 2022
- DAC2021 Young Fellows program 2021
- Northwestern University Ph.D. Fellowship 2018
- Zhiyuan College honor scholarship 2014 – 2018
- Excellent students’ scholarship, Shanghai Jiao Tong University 2014 – 2018
- Bronze medal in National Olympiad in Informatics 2013
- Gold medal in National Olympiad in Informatics in Provinces 2012