Ruochen Wang (王若宸)

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Research Interests

My main research focus is on developing efficient, automated, and robust machine learning algorithms. Currently, I am working on the following problems:

- AutoML
  - Neural Architecture Search
  - Hyperparameter Tuning
  - Dataset Learning
- Scalable Graph Neural Networks

Education

01/2020 to present	**University of California at Los Angeles (UCLA)**	**U.S.**

Computer Science Department

- Ph.D. in Computer Science; Advisor: Prof. Cho-Jui Hsieh
- M.S. in Computer Science; GPA: 4.0/4.0

09/2015 to 08/2019	**The University of Michigan-Ann Arbor (UMich)**	**U.S.**

Department of Electrical Engineering and Computer Science (EECS)

- B.S. in Computer Science & B.S. in Statistics; GPA: 4.0/4.0; Graduated with Highest Distinction

09/2013 to 06/2015	**(Transferred) Shanghai University of Finance and Economics (SUFE)**	**China**

School of Finance

- Financial Experimental Class; GPA: 3.93/4.0; **Program Rank: 1/30**

Selected Honors

- Outstanding Paper Award - ***ICLR 2021***, 04/2021.
- Award of Excellence (10%), ***Microsoft Research Asia (MSRA)***, 09/2019.
- Berkeley Fung's Excellence Scholarship, ***UC Berkeley Graduate Admission Committee***, 03/2019.
- Outstanding Intern Award, ***SenseTime***, 01/2019.
- James B. Angell Scholar, ***The University of Michigan***, 2017-2019.
- Shanghai City Scholarship (0.6%), ***Shanghai City Government***, 09/2014.

Publications

- Yuanhao Xiong, Li-Cheng Lan, Xiangning Chen, **Ruochen Wang**, Cho-Jui Hsieh. Learning to Schedule Learning rate with Graph Neural Networks. (*ICLR 2022*).
- Shoukang Hu*, **Ruochen Wang***, Lanqing Hong, Zhenguo Li, Cho-Jui Hsieh, Jiashi Feng. Anonymous paper. (* equal contribution) (*ICLR 2022*).
- **Ruochen Wang**, Xiangning Chen, Minhao Cheng, Xiaocheng Tang, Cho-Jui Hsieh. RANK-NOSH: Efficient Predictor-Based Architecture Search via Non-Uniform Successive Halving. (*ICCV 2021*).
- **Ruochen Wang**, Minhao Cheng, Xiangning Chen, Xiaocheng Tang, Cho-Jui Hsieh. Rethinking architecture selection in differentiable NAS. (*ICLR 2021*). **Outstanding Paper Award**.
- Xiangning Chen*, **Ruochen Wang***, Minhao Cheng*, Xiaocheng Tang, Cho-Jui Hsieh. DrNAS: Dirichlet Neural Architecture Search. (* equal contribution) (*ICLR 2021*).

Research Experience

01/2020 to Present	**UCLA Samueli School of Engineering** *Graduate Student Researcher with Prof. Cho-Jui Hsieh*	**Los Angeles**

Neural Architecture Search:
- Proposed a method to measure and alleviate the adverse effects of weight-sharing in One-Shot NAS; obtained <u>SOTA on all major NAS search spaces and dataset</u> (ICLR 2022).
- <u>Analyzed and explained the failure modes of Differentiable NAS from the long-overlooked architecture selection perspective</u> (<u>ICLR 2021 Oral, Outstanding Paper Award</u>).
- Proposed a scheduling algorithm and a learning-to-rank framework that reduce the search cost of predictor-based NAS by 5x while achieving the same search performance (ICCV 2021).
- Proposed (together with collaborators) a method to improve the robustness of differentiable NAS via Bayesian learning with Dirichlet distribution; derived a theoretical bound to prove the effectiveness of the proposed method utilizing Laplacian Approximation (ICLR 2021).
- Investigated advanced bilevel optimization methods for Differentiable Architecture Search.

Dataset Learning:
- Improved the performance of Dataset Distillation by 5% via bag-of tricks on its optimization.
- Investigated the effectiveness of Dataset Distillation on Federated Learning and NLP tasks (ongoing).

Graph Neural networks:
- Explored stochastic learning algorithms for Graph Neural Networks (ongoing).

05/2019 to 09/2019	**Microsoft Research** *Research Intern*	**Beijing**

Neural Architecture Search:
- Conducted research on <u>resource-constrained neural architecture search</u> for production purposes.

Reinforcement Learning:
- Drafted a paper on improving the optimization of the Proximal Policy Gradient via Interior Point methods.

09/2018 to 03/2019	**SenseTime** *Research Intern*	**Shanghai**

Adversarial Robustness:
- Conducted research on the <u>adversarial robustness in the frequency domain</u>; developed evolution and gradient-based method to generate adversarial frequencies.

09/2017 to 04/2018	**UMich College of Engineering** *Research Assistant with Prof. Honglak Lee*	**Ann Arbor**

Vision Meets Language:
- Worked on <u>natural language queried object detection</u> with a word-sensitive discriminative bimodal network that aimed at solving dataset bias problem utilizing Bayesian reformulation.

05/2017 to 09/2017	**UMich College of Engineering** *Research Assistant*	**Ann Arbor**

Object Detection & Tracking:
- Participated in several computer vision projects including object detection (e.g., faster RCNN, YOLO in C), and multi-objective tracking with Siamese stacked hourglass network.

Professional Services

- Reviewer for ICML 2021, NeurIPS 2021, ICLR 2022, ICML 2022.