

Ruochen Wang (王若宸)

ruocwang@google.com / ruocwang@ucla.edu / ruocwang@umich.edu • 3108196039

Homepage: <https://ruocwang.github.io/>

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
 - Learning to Optimize
 - Dataset Compression
- Scalable Graph Neural Networks
- Transformers (efficient inference and multimodality)

Education

01/2020 to present	University of California at Los Angeles (UCLA) <i>Computer Science Department</i>	U.S.
	<ul style="list-style-type: none">• 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) <i>Department of Electrical Engineering and Computer Science (EECS)</i>	U.S.
	<ul style="list-style-type: none">• B.S. in Computer Science & B.S. in Statistics; GPA: 4.0/4.0	
09/2013 to 06/2015	(Transferred) Shanghai University of Finance and Economics (SUFU) <i>School of Finance</i>	China
	<ul style="list-style-type: none">• Financial Experimental Class; GPA: 3.93/4.0; Program Rank: 1/30	

Selected Honors

- Outstanding Graduate Student (for Master's degree, 1 per department), *UCLA CS Department*, 05/2022.
- **Outstanding Paper Award, *ICLR 2021*, 04/2021.**
- Award of Excellence (10%), *Microsoft Research Asia (MSRA)*, 09/2019.
- Highest Distinction Graduate Award, *The University of Michigan*, 08/2019.
- 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

05/2022 to Present	Google Research <i>Student Researcher on ML Vision Synergy</i>	U.S.
01/2020 to Present	UCLA Samueli School of Engineering <i>Graduate Student Researcher with Prof. Cho-Jui Hsieh</i> Neural Architecture Search: <ul style="list-style-type: none"> ● 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 datasets</u> (ICLR 2022). ● 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). ● <u>Analyzed and explained the failure modes of Differentiable NAS from the long-overlooked architecture selection perspective</u> (ICLR 2021 Oral, Outstanding Paper Award). ● 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: <ul style="list-style-type: none"> ● Investigating the effectiveness of Dataset Distillation on non-i.i.d. Federated Learning (ongoing). ● Scaling up Dataset Compression Methods to Large-Scale datasets. (ongoing). Graph Neural Networks: <ul style="list-style-type: none"> ● Exploring stochastic learning algorithms for Graph Neural Networks (ongoing). Transformers: <ul style="list-style-type: none"> ● Studying the efficiency and multimodality of Transformer models (ongoing). 	Los Angeles
05/2019 to 09/2019	Microsoft Research <i>Research Intern</i> Neural Architecture Search: <ul style="list-style-type: none"> ● Conducted research on <u>resource-constrained neural architecture search</u> for production purposes. Reinforcement Learning: <ul style="list-style-type: none"> ● Drafted a paper on improving the optimization of the Proximal Policy Gradient via Interior Point methods. 	Beijing
09/2018 to 03/2019	SenseTime <i>Research Intern</i> Adversarial Robustness: <ul style="list-style-type: none"> ● Conducted research on the <u>adversarial robustness in the frequency domain</u>; developed evolution and gradient-based method to generate adversarial frequencies. 	Shanghai
09/2017 to 04/2018	UMich College of Engineering <i>Research Assistant with Prof. Honglak Lee</i> Vision Meets Language: <ul style="list-style-type: none"> ● Worked on <u>natural language queried object detection</u> with a word-sensitive discriminative bimodal network that aimed at solving dataset bias problems utilizing Bayesian reformulation. 	Ann Arbor
05/2017 to 09/2017	UMich College of Engineering <i>Research Assistant</i> Object Detection & Tracking: <ul style="list-style-type: none"> ● 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. 	Ann Arbor

Professional Services

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