

Ruochen Wang (王若宸)

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

Research Interests

I study the problem of AI for AI. The goal is to leverage the power of A.I. to automatize the development of itself. I have mainly focused on a prominent direction under this concept - Automated Machine Learning (AutoML), which includes:

- Neural Architecture Search (NAS)
- Optimize Search
- Dataset Compression (DC)

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; Advisor: Prof Cho-Jui Hsieh	
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 & Preprints (1st-author marked blue)

- Justin Cui, **Ruochen Wang**, Si Si, Cho-Jui Hsieh. Scaling Up Dataset Distillation to ImageNet-1K with Constant Memory. (Under Review 2023)
- **Ruochen Wang**, Yuanhao Xiong, Minhao Cheng, Cho-Jui Hsieh. Efficient Non-Parametric Optimizer Search for Diverse Tasks. (*NeurIPS 2022*)
- Justin Cui, **Ruochen Wang**, Si Si, Cho-Jui Hsieh. DC-BENCH: Dataset Condensation benchmark. (*NeurIPS 2022 Dataset and Benchmark*)
- Yuanhao Xiong*, **Ruochen Wang***, Minhao Cheng, Cho-Jui Hsieh. FedDM: Iterative Distribution Matching for Communication-Efficient Federated Learning. (*Arxiv Preprint 2022*)
- 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. Generalizing Few-Shot NAS with Gradient Matching. (* 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, with Dr. Boqing Gong and Dr. Ting Liu</i>	U.S.
	<ul style="list-style-type: none"> • Efficient CNN-Transformer hybrid video architecture with linear attention. 	
01/2020 to Present	UCLA Samueli School of Engineering <i>Graduate Student Researcher with Prof. Cho-Jui Hsieh</i>	Los Angeles
	AutoML: <ul style="list-style-type: none"> • Proposed the first efficient, scalable, and generalizable optimizer search framework for diverse tasks (NeurIPS 2022). • 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). • <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). Dataset Learning: <ul style="list-style-type: none"> • Investigating the effectiveness of Dataset Distillation for non-i.i.d. Federated Learning (NeurIPS 2022 workshop). • Co-developing a benchmark for Dataset Condensation methods. (NeurIPS 2022). Graph Neural Networks: <ul style="list-style-type: none"> • Exploring stochastic learning algorithms for Graph Neural Networks. 	
05/2019 to 09/2019	Microsoft Research <i>Research Intern</i>	Beijing
	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. 	
09/2018 to 03/2019	SenseTime <i>Research Intern</i>	Shanghai
	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. 	
09/2017 to 04/2018	UMich College of Engineering <i>Research Assistant with Prof. Honglak Lee</i>	Ann Arbor
	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. 	

Professional Services

- Reviewer for ICML 2021~2023, NeurIPS 2021~2022, ICLR 2022~2023, TMLR, CVPR 2023
- Co-organizing the 1st workshop on dataset distillation at ICML 2023 (ongoing)