

Ruochen Wang (王若宸)

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 and Hyperparameter Tuning
- Dataset Learning
- Scalable Graph Neural Networks
- Adversarial Robustness

Education

01/2020 to present	University of California at Los Angeles (UCLA) <i>Computer Science Department</i> • Ph.D. in Computer Science; Advisor: <i>Prof. Cho-Jui Hsieh</i>	U.S.
09/2015 to 08/2019	The University of Michigan-Ann Arbor (UMich) <i>Department of Electrical Engineering and Computer Science (EECS)</i> • B.S. in Computer Science & B.S. in Statistics; GPA: 4.0/4.0; Graduated with Highest Distinction	U.S.
09/2013 to 06/2015	(Transferred) Shanghai University of Finance and Economics (SUFU) <i>School of Finance</i> • Financial Experimental Class; GPA: 3.93/4.0; Program Rank: 1/30	China

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.

Selected Publications & Submissions

- Shoukang Hu*, **Ruochen Wang***, Lanqing Hong, Zhenguo Li, Cho-Jui Hsieh, Jiashi Feng. Anonymous paper. (* equal contribution) (under review at *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*).

Work Experience

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| 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 |

Research Experience

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| 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 dataset</u> (under review at 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 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: <ul style="list-style-type: none">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: <ul style="list-style-type: none">Explored stochastic learning algorithms for Graph Neural Networks (ongoing). | Los Angeles |
| 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 problem 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.