

## Ruochen Wang (王若宸)

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### Research Interests

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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

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

### Selected Honors

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- **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

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- 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*).

## Research Experience

01/2020 to Present	<b>UCLA Samueli School of Engineering</b> <i>Graduate Student Researcher with Prof. Cho-Jui Hsieh</i> <b>Neural Architecture Search:</b> <ul style="list-style-type: none"><li>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).</li><li><u>Analyzed and explained the failure modes of Differentiable NAS from the long-overlooked architecture selection perspective</u> (ICLR 2021 Oral, Outstanding Paper Award).</li><li>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).</li><li>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).</li><li>Investigated advanced bilevel optimization methods for Differentiable Architecture Search.</li></ul> <b>Dataset Learning:</b> <ul style="list-style-type: none"><li>Improved the performance of Dataset Distillation by 5% via bag-of tricks on its optimization.</li><li>Investigated the effectiveness of Dataset Distillation on Federated Learning and NLP tasks (ongoing).</li></ul> <b>Graph Neural networks:</b> <ul style="list-style-type: none"><li>Explored stochastic learning algorithms for Graph Neural Networks (ongoing).</li></ul>	<b>Los Angeles</b>
05/2019 to 09/2019	<b>Microsoft Research</b> <i>Research Intern</i> <b>Neural Architecture Search:</b> <ul style="list-style-type: none"><li>Conducted research on <u>resource-constrained neural architecture search</u> for production purposes.</li></ul> <b>Reinforcement Learning:</b> <ul style="list-style-type: none"><li>Drafted a paper on improving the optimization of the Proximal Policy Gradient via Interior Point methods.</li></ul>	<b>Beijing</b>
09/2018 to 03/2019	<b>SenseTime</b> <i>Research Intern</i> <b>Adversarial Robustness:</b> <ul style="list-style-type: none"><li>Conducted research on the <u>adversarial robustness in the frequency domain</u>; developed evolution and gradient-based method to generate adversarial frequencies.</li></ul>	<b>Shanghai</b>
09/2017 to 04/2018	<b>UMich College of Engineering</b> <i>Research Assistant with Prof. Honglak Lee</i> <b>Vision Meets Language:</b> <ul style="list-style-type: none"><li>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.</li></ul>	<b>Ann Arbor</b>
05/2017 to 09/2017	<b>UMich College of Engineering</b> <i>Research Assistant</i> <b>Object Detection &amp; Tracking:</b> <ul style="list-style-type: none"><li>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.</li></ul>	<b>Ann Arbor</b>

## Professional Services

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