

# RUOCHEN WANG

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

## RESEARCH AREA

Efficient, Automated, and Robust Deep Learning Methods, including AutoML (NAS, HPO, Dataset), GNN, e.t.c.

## EDUCATION

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|-----------------------|--|--------------|
| 01/2020 to<br>present | <b>University of California at Los Angeles (UCLA)</b><br><b>Computer Science Department</b><br>• M.S. -> Ph.D. in Computer Science, GPA 4.0/4.0<br>• Advisor: <i>Prof. Cho-Jui Hsieh</i>   | <b>U.S.</b>  |
| 09/2015 to<br>08/2019 | <b>The University of Michigan-Ann Arbor (UMich)</b><br><b>Department of Electrical Engineering and Computer Science (EECS)</b><br>• B.S. in Computer Science & B.S. in Statistics, <b>Graduated with Highest Distinction</b> , GPA: 4.0/4.0<br>• Course highlight: <i>Machine Learning, Computer Vision, Natural Language Processing, Data Mining, Operating System, Theoretical Statistics, Applied Regression Analysis, Statistical Learning</i><br>• Selected Books I read: <i>Numerical Optimization (Stephen Wright), Convex Optimization (Boyd), PRML, Reinforcement Learning (Sutton)</i> | <b>U.S.</b>  |
| 09/2013 to<br>06/2015 | <b>(Transferred) Shanghai University of Finance and Economics (SUFU)</b><br><b>School of Finance</b><br>• Financial Experimental Class (30 students selected university-wide after year 1)<br>• <b>Program Rank: 1/30</b> , Program GPA: 3.93/4.0<br>• Course highlight: <i>Mathematical Analysis (Single and Multi-Variable), Linear Algebra, Differential Equations, Stochastic Processes, Game Theory</i>   | <b>China</b> |

## AWARDS & SCHOLARSHIPS

- **Outstanding Paper Award** (first author) - **ICLR2021**, 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.
- Honorable Employee, **OvoTechnologies**, 09/2016.
- James B. Angell Scholar, **The University of Michigan**, 2017-2019.
- EECS Scholar, **The University of Michigan**, 2017-2019.
- University Honors, **The University of Michigan**, 2015-2018.
- Shanghai City Scholarship (0.6%), **Shanghai City Government**, 09/2014.
- Peoples' Scholarship 1st-prize (2%), **Shanghai University of Finance and Economics**, 09/2014.

## PUBLICATIONS & SUBMISSIONS (Only 1st author papers are listed)

- Shoukang Hu\*, **Ruochen Wang\***, Lanqing Hong, Zhenguo Li, Cho-Jui Hsieh, Jiashi Feng. *Anonymous paper*. (\* equal contribution) (under review ICLR2022)
- **Ruochen Wang**, Xiangning Chen, Minhao Cheng, Xiaocheng Tang, Cho-Jui Hsieh. *RANK-NOSH: Efficient Predictor-Based Architecture Search via Non-Uniform Successive Halving*. (ICCV2021)
- **Ruochen Wang**, Minhao Cheng, Xiangning Chen, Xiaocheng Tang, Cho-Jui Hsieh. *Rethinking architecture selection in differentiable NAS*. (ICLR2021 **Outstanding Paper Award & ORAL**).
- Xiangning Chen\*, **Ruochen Wang\***, Minhao Cheng\*, Xiaocheng Tang, Cho-Jui Hsieh. *DrNAS: Dirichlet Neural Architecture Search*. (\* equal contribution) (ICLR2021).

## RESEARCH EXPERIENCE

02/2020 to	<b>UCLA Samueli School of Engineering</b>	<b>Los Angeles</b>
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Present	<b><i>Graduate Research Assistant with Professor Cho-Jui Hsieh</i></b>	
	<ul style="list-style-type: none"> <li>• Study weight-sharing in NAS (under review)</li> <li>• Analyze Dataset Distillation (ongoing)</li> <li>• Scalability in Graph Neural Network (ongoing)</li> <li>• A finished project on reducing computation cost of predictor-based Neural Architecture Search, SOTA in terms of both accuracy and efficiency among predictor-based methods. (ICCV2021)</li> <li>• A finished paper on explaining the failure modes of Differentiable NAS from the architecture selection perspective; proposed a generic perturbation-based selection method that achieves consistent improvement on multiple search spaces, datasets, and base methods. (ICLR2021 Oral, Outstanding Paper Award)</li> <li>• A finished paper on improving the effectiveness and robustness of differentiable NAS via Bayesian learning with Dirichlet distribution; derived a theoretical bound to prove the effectiveness of proposed method based utilizing Laplacian Approximation; achieved SOTA results on NAS-Bench-201 and ImageNet. (ICLR2021)</li> <li>• One project on bridging the gap between decision-based black-box attacks and white-box attacks (Adversarial Robustness) by improving the zero-order optimization.</li> <li>• Investigated advanced bilevel optimization methods for NAS.</li> </ul>	
05/2019 to 09/2019	<b>Microsoft Research Asia (MSRA)</b> <b><i>Research Intern</i></b>	<b>Beijing</b>
	<ul style="list-style-type: none"> <li>• Conducted research on neural architecture search for production purposes, in particular, resource-constraint neural architecture search; proposed to utilize randomized supernet training + evolutionary post-searching framework to replace their original gradient-based methods; increase the accuracy by 1% while reducing the latency by 20%.</li> <li>• Replicated several neural architecture search methods, such as FBNet and FairNAS.</li> <li>• Drafted a paper on improving the optimization of the Proximal Policy Gradient via the interior point method.</li> </ul>	
09/2018 to 03/2019	<b>SenseTime</b> <b><i>Research Intern</i></b>	<b>Shanghai</b>
	<ul style="list-style-type: none"> <li>• Conducted research on the adversarial attack in the frequency domain; developed evolution and gradient-based method to generate adversarial frequencies; achieved an average distortion of only 4-pixel values, significantly lower than 16-pixel values proposed by a concurrent work.</li> <li>• Co-authored an A.I. textbook, designed and developed 25% of the associated experiments on the topic of computer vision and machine learning in python, and pushed them into production.</li> </ul>	
09/2017 to 04/2018	<b>UMich College of Engineering</b> <b><i>Research Assistant to Prof. Honglak Lee</i></b>	<b>Ann Arbor</b>
	<ul style="list-style-type: none"> <li>• Worked on natural language queried object detection with a word-sensitive discriminative bimodal network that aimed at solving dataset bias problem utilizing Bayesian reformulation.</li> </ul>	
05/2017 to 09/2017	<b>UMich College of Engineering</b> <b><i>Research Assistant</i></b>	<b>Ann Arbor</b>
	<ul style="list-style-type: none"> <li>• Participated in several computer vision projects, such as object detection (e.g., faster RCNN, YOLO in C), and multi-objective tracking with Siamese stacked hourglass network.</li> <li>• Collected and formatted specific images and concepts from ImageNet and MS-COCO datasets for training video understanding models.</li> </ul>	

## DEVELOPER EXPERIENCE

06/2018 to 08/2018	<b>ChangXin Memory Inc</b> <b><i>Software Engineer</i></b>	<b>Hefei</b>
	<ul style="list-style-type: none"> <li>• Designed a distributed data analysis module to transform python code written by data analysts to a distributed Spark job and integrated the module to Rapid Miner, the organization-wide analytic platform.</li> </ul>	
08/2016 to 09/2016	<b>OVO Technology-Robotics Startup at Institute of Advanced Technology</b> <b><i>Software Engineer</i></b>	<b>Hefei</b>
	<ul style="list-style-type: none"> <li>• Developed a speech recognition system in C based on iFlytek's cloud service, the navigation system in ROS, and communications between these two modules and the camera in Matlab.</li> </ul>	