Hongyi Wang

Postdoctoral Fellow

Machine Learning Department
Carnegie Mellon University
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https://hwang595.github.io/

Education

2016–2021 **PhD in Computer Science** *University of Wisconsin–Madison.*
Advisor: Dimitris Papailiopoulos

2016–2019 **MS in Computer Science** *University of Wisconsin–Madison.*
Thesis: *On improving the scalability and robustness of distributed machine learning algorithms and systems*

2012–2016 **BS in Electrical Enigneering** *Hangzhou Dianzi University.*
GPA: 4.8/5.0 (93.3/100)
Rank: 1/250
Advisors: Kaixin Song, Zhonghai Zhang

Research interests

Broad interests: *Distributed machine learning algorithms and systems.*

Specific interests: *Scalability and robustness of distributed machine learning systems and federated learning.*

Research/Work Experience

Sep. 2021-current **Postdoctoral Fellow** *Machine Learning Department at Carnegie Mellon University.*
Supervised by: Prof. Eric Xing

Summer 2020 **Research Intern** *Microsoft Research.*
Supervised by: Minjia Zhang and Yuxiong He

Summer 2019 **Research Intern** *IBM Research.*
Supervised by: Mikhail Yurochkin and Yasaman Khazaeni

2017-2021 **Research Assistant** *ECE department at UW-Madison.*
Supervised by: Prof. Dimitris Papailiopoulos

Summer 2018 **Visiting Student** *BLISS at UC Berkeley.*
Supervised by: Prof. Kannan Ramchandran
Project: *Defense of adversarial attack via sparse coding*

2016-2017 **Research Assistant** *CS department at UW-Madison.*
Supervised by: Prof. Michael Gleicher
Project: *Physically-Responsive Collaborative Robot Manipulation*

Honors & Awards

2020 **Top Reviewer Award** *ICML 2020.*

2020 **The Baidu Best Paper Award** *SpicyFL workshop at NeurIPS 2020.*

2019 **Top Reviewer Award** *NeurIPS 2019.*

2018-2019 **Student Travel Award** *NeurIPS 2018, 2019.*

2018 **Student Travel Award** *ICML 2018*.

2015 **National Scholarship of China (Top 2%)**.

2015 **Huawei Scholarship** *awarded by Huawei Technologies Co., Ltd.*

2012-2015 **First-class Scholarship for Outstanding Students of HDU (Top 5%)**.

Publications

(∗ stands for joint first author)

[1] Saurabh Agarwal, **Hongyi Wang**, Shivaram Venkataraman, and Dimitris Papailiopoulos. On the utility of gradient compression in distributed training systems. *MLSys*, 2022.

[2] **Hongyi Wang**, Saurabh Agarwal, and Dimitris Papailiopoulos. Pufferfish: Communication-efficient models at no extra cost. *MLSys*, 2021.

[3] Saurabh Agarwal, **Hongyi Wang**, Kangwook Lee, Shivaram Venkataraman, and Dimitris Papailiopoulos. Accordion: Adaptive gradient communication via critical learning regime identification. *MLSys*, 2021.

[4] Chaoyang He, Songze Li, Jinhyun So, Mi Zhang, **Hongyi Wang**, Xiaoyang Wang, Praneeth Vepakomma, Abhishek Singh, Hang Qiu, Li Shen, Peilin Zhao, Yan Kang, Yang Liu, Ramesh Raskar, Qiang Yang, Murali Annavaram, and Salman Avestimehr. Fedml: A research library and benchmark for federated machine learning. *NeurIPS SpicyFL workshop (**Best Paper Award**)*, 2020.

[5] **Hongyi Wang**, Kartik Sreenivasan, Shashank Rajput, Harit Vishwakarma, Saurabh Agarwal, Jy-yong Sohn, Kangwook Lee, and Dimitris Papailiopoulos. Attack of the tails: Yes, you really can backdoor federated learning. *NeurIPS*, 2020.

[6] **Hongyi Wang**, Mikhail Yurochkin, YueKai Sun, Dimitris Papailiopoulos, and Yasaman Khazaeni. Federated learning with matched averaging. *ICLR (**Oral Presentation**)*, 2020.

[7] Shashank Rajput*, **Hongyi Wang***, Zachary Charles, and Dimitris Papailiopoulos. Detox: A redundancy-based framework for faster and more robust gradient aggregation. *NeurIPS*, 2019.

[8] **Hongyi Wang**, Zachary Charles, and Dimitris Papailiopoulos. Convergence and runtime of approximate gradient coded gradient descent. In *ICML 2019 CodML workshop*, 2019.

[9] Lingjiao Chen, **Hongyi Wang**, Leshang Chen, Paraschos Koutris, and Arun Kumar. Demonstration of nimbus: Model-based pricing for machine learning in a data marketplace. In *SIGMOD 2019*, pages 1885–1888. ACM, 2019.

[10] **Hongyi Wang***, Scott Sievert*, Shengchao Liu, Zachary Charles, Dimitris Papailiopoulos, and Stephen Wright. Atomo: Communication-efficient learning via atomic sparsification. In *NeurIPS*, 2018.

[11] Lingjiao Chen, **Hongyi Wang**, Jinman Zhao, Dimitris Papailiopoulos, and Paraschos Koutris. The effect of network width on the performance of large-batch training. In *NeurIPS*, 2018.

[12] Lingjiao Chen, **Hongyi Wang**, Zachary Charles, and Dimitris Papailiopoulos. Draco: Byzantine-resilient distributed training via redundant gradients. In *ICML*, 2018.

[13] Lingjiao Chen, **Hongyi Wang**, and Dimitris Papailiopoulos. Draco: Robust distributed training against adversaries. In *SysML*, 2018.

[14] Guru Subramani, Daniel Rakita, **Hongyi Wang**, Jordan Black, Michael Zinn, and Michael Gleicher. Recognizing actions during tactile manipulations through force sensing. In *IROS*, pages 4386–4393. IEEE, 2017.

Preprints

[15] Kartik Sreenivasan, Jy-yong Sohn, Liu Yang, Matthew Grinde, Alliot Nagle, **Hongyi Wang**, Kangwook Lee, and Dimitris Papailiopoulos. Rare gems: Finding lottery tickets at initialization. *arXiv preprint arXiv:2202.12002*, 2022.

[16] with Jianyu Wang, Zachary Charles, Zheng Xu, Gauri Joshi, H Brendan McMahan, et al. A field guide to federated optimization. *arXiv preprint arXiv:2107.06917*, 2021.

[17] Lingjiao Chen*, Leshang Chen*, **Hongyi Wang***, Susan Davidson, and Edgar Dobriban. Solon: Communication-efficient byzantine-resilient distributed training via redundant gradients. *arXiv preprint arXiv:2110.01595*, 2021.

[18] **Hongyi Wang**, Zachary Charles, and Dimitris Papailiopoulos. Erasurehead: Distributed gradient descent without delays using approximate gradient coding. *arXiv preprint arXiv:1901.09671*, 2019.

Invited Talks

2022 **MLOPT Idea Seminar.** *University of Wisconsin-Madison*, "On the utility of gradient compression in distributed training systems".

2021 **Federated Learning One World (FLOW) Seminar.** *Virtual*, "On the efficiency and robustness of federated learning".

2021 **vITAL Research Lab Seminar.** *University of Southern California*, "Communication-efficient and robust distributed machine learning".

2021 **CMU Sailing Lab Seminar.** *Carnegie Mellon University*, "PUFFERFISH: Communication-efficient Models At No Extra Cost".

2020 **Hazy Research Seminar.** *Stanford University*, "PUFFERFISH: Communication-efficient Models At No Extra Cost".

Services

Reviewer (journal): *JMLR, TMLR, IEEE TNNLS, IEEE IoT-J.*

Reviewer (conference): *ICML 2019-2022, NeurIPS 2019-2021, ICLR 2021-2022, CVPR 2021-2022, ICCV 2021.*

Program Committee Member: *AAAI 2021-2022, MLSys 2022 Artifact Evaluation Committee.*