

Hongyi Wang

Postdoctoral Fellow

Machine Learning Department

Carnegie Mellon University

✉ hongyiwa@andrew.cmu.edu

📄 <https://hwang595.github.io/>

Positions

- Sep. 2021–current **Postdoctoral Fellow** *Machine Learning Department at CMU.*
Hosted by Eric Xing
- Summer 2020 **Research Intern** *Microsoft Research.*
Hosted by Minjia Zhang and Yuxiong He
- Summer 2019 **Research Intern** *IBM Research.*
Hosted by Mikhail Yurochkin and Yasaman Khazaeni
- Summer 2018 **Visiting Student** *UC Berkeley.*
Hosted by Kannan Ramchandran
- 2016–2021 **Research Assistant** *UW-Madison.*

Research interests

Broad interests: *Efficient computing algorithms and systems.*

Specific interests: *Scalable and efficient machine learning systems.*

Education

- 2016–2021 **Ph.D. in Computer Science** *University of Wisconsin–Madison.*
Advisor: Dimitris Papailiopoulos
- 2016–2019 **MS in Computer Science** *University of Wisconsin–Madison.*
- 2012–2016 **BS in Electrical Engineering** *Hangzhou Dianzi University.*

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 Annamalai, 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)*, 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**, Eric Xing, 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.

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

Invited Talks

- 2022 **Center of Integrative Artificial Intelligence (CIAI) Colloquium.** *Mohamed bin Zayed University of Artificial Intelligence*, “On the utility of gradient compression in distributed training systems”.
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

Program committee: *MLSys 2022 (Artifact Evaluation Committee), SIGKDD 2022, AAAI 2021-2022.*
Conference session chair: *Tutorial session chair, ICML 2022.*
Reviewer (journal): *JMLR, TMLR, IEEE TNNLS, IEEE IoT-J.*
Reviewer (conference): *ICML 2019-2022, NeurIPS 2019-2022, ICLR 2021-2022, CVPR 2021-2022, ICCV 2021, SIGKDD 2022.*

Teaching Experience

- Spring 2022 **Guest Lecturer** *UW-Madison ECE826: Theoretical Foundations of Large-scale Machine Learning.*