Weihua Hu

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Born in Tokyo, Japan
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Work and Education

- **Kumo AI** CA, USA
  Software Engineer (Algorithms) January 2023 –
  - Research and development to productionize Graph Neural Networks on relational database.
- **Stanford University** CA, USA
  Ph.D. in Computer Science September 2018 – January 2023
  - Supervisor: Jure Leskovec
  - Thesis: On the Predictive Power of Graph Neural Networks (**KDD Outstanding Doctoral Dissertation Award**)
- **University of Tokyo** Tokyo, Japan
  M.S. in Computer Science April 2016 – August 2018
  - Supervisor: Masashi Sugiyama
  - Master thesis: Researches on Robust Machine Learning (**Dean's Award**)
  - Ph.D. study (from April 2018) sponsored by Research Fellowship for Young Scientists (DC1).
- **University of Tokyo** Tokyo, Japan
  B.E. in Mathematical Engineering April 2012 – March 2016
  - Supervisor: Hirosuke Yamamoto
  - Graduation thesis: Worst-Case Redundancy of Optimal Binary AIFV Codes and their Extended Codes.

Publications

- **Weihua Hu**, Kaidi Cao, Kexin Huang, Edward W Huang, Karthik Subbian, Kenji Kawaguchi, Jure Leskovec. TuneUp: A Simple Improved Training Strategy for Graph Neural Networks. *Preprint*, arXiv:2210.14843
- Remi Lam, Alvaro Sanchez-Gonzalez, Matthew Willson, Peter Wirnsberger, Meire Fortunato, Alexander Pritzel, Suman Ravuri, Timo Ewalds, Ferran Alet, Zach Eaton-Rosen, **Weihua Hu**, Alexander Merose, Stephan Hoyer, George Holland, Jacklynn Stott, Oriol Vinyals, Shakir Mohamed, Peter Battaglia. Learning skillful medium-range global weather forecasting. **Science**, 2023.
- Shenyang Huang*, Farimah Poursafaei*, Jacob Danovitch, Matthias Fey, **Weihua Hu**, Emanuele Rossi, Jure Leskovec, Michael Bronstein, Guillaume Rabusseau, Reihaneh Rabbany Temporal Graph Benchmark for Machine Learning on Temporal Graphs. In *Neural Information Processing Systems (NeurIPS) Track on Datasets and Benchmarks*, 2023.
- **Weihua Hu**, Rajas Bansal, Kaidi Cao, Nikhil Rao, Karthik Subbian, Jure Leskovec. Learning Backward Compatible Embeddings. In *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, Applied Data Science Track, 2022.
- Shiori Sagawa*, Pang Wei Koh*, Tony Lee*, Irena Gao*, Sang Michael Xie, Kendrick Shen, Ananya Kumar, **Weihua Hu**, Michihiro Yasunaga, Henrik Marklund, Sara Beery, Etienne David, Ian Stavness, Wei Guo, Jure Leskovec, Kate Saenko, Tatsunori Hashimoto, Sergey Levine, Chelsea Finn, and Percy Liang. Extending the WILDS benchmark for unsupervised adaptation. In *International Conference on Learning Representations (ICLR)*, 2022. **(oral, 1.5% acceptance rate)**
- **Weihua Hu**, Matthias Fey, Hongyu Ren, Maho Nakata, Yuxiao Dong, Jure Leskovec. OGB-LSC: A Large-Scale Challenge for Machine Learning on Graphs. In *Neural Information Processing Systems (NeurIPS) Track on Datasets and Benchmarks*, 2021. **Organized the KDD Cup 2021 and NeurIPS 2022 competition.**

- Lowik Chanussot*, Abhishek Das*, Siddharth Goyal*, Thibaut Lavril*, Muhammed Shuaibi*, Morgane Riviere, Kevin Tran, Javier Heras-Domingo, Caleb Ho, **Weihua Hu**, Aini Palizhati, Anuroop Sriram, Brandon Wood, Junwoong Yoon, Devi Parikh, C. Lawrence Zitnick, Zachary Ulissi. The Open Catalyst 2020 (OC20) Dataset and Community Challenges. ACS Catalysis, 2021.
- Pang Wei Koh*, Shiori Sagawa*, Henrik Marklund, Sang Michael Xie, Marvin Zhang, Akshay Balsubramani, **Weihua Hu**, Michihiro Yasunaga, Richard Lanas Phillips, Irena Gao, Tony Lee, Etienne David, Ian Stavness, Wei Guo, Berton A. Earnshaw, Imran S. Haque, Sara Beery, Jure Leskovec, Anshul Kundaje, Emma Pierson, Sergey Levine, Chelsea Finn, Percy Liang. WILDS: A benchmark of in-the-wild distribution shifts. In *International Conference on Machine Learning (ICML)*, 2021. **(long talk)**
- **Weihua Hu**, Muhammed Shuaibi, Abhishek Das, Siddharth Goyal, Anuroop Sriram, Jure Leskovec, Devi Parikh, C. Lawrence Zitnick. ForceNet: A Graph Neural Network for Large-Scale Quantum Chemistry Calculations. In *ICLR workshop on Deep Learning for Simulation*, 2021. **(Best Paper Award)**
- **Weihua Hu**, Matthias Fey, Marinka Zitnik, Yuxiao Dong, Hongyu Ren, Bowen Liu, Michele Catasta, Jure Leskovec. Open Graph Benchmark: Datasets for Machine Learning on Graphs. In *Neural Information Processing Systems (NeurIPS)*, 2020. **(spotlight, 4% acceptance rate)**
- **Weihua Hu***, Bowen Liu*, Joseph Gomes, Marinka Zitnik, Percy Liang, Vijay Pande, Jure Leskovec. Strategies for Pre-training Graph Neural Networks. In *International Conference on Learning Representations (ICLR)*, 2020. **(spotlight, 6% acceptance rate)**, In *NeurIPS workshop on Graph Representation Learning* , 2019. **(oral, 3 out of 88 accepted papers)**
- Hongyu Ren*, **Weihua Hu***, Jure Leskovec. Query2box: Reasoning over Knowledge Graphs in Vector Space Using Box Embeddings. In *International Conference on Learning Representations (ICLR)*, 2020.
- Keyulu Xu*, **Weihua Hu***, Jure Leskovec, Stefanie Jegelka. How Powerful are Graph Neural Networks? In *International Conference on Learning Representations (ICLR)*, 2019. **(oral, 1.5% acceptance rate)**
- Bo Han, Quanming Yao, Xingrui Yu, Gang Niu, Miao Xu, **Weihua Hu**, Ivor Tsang, Masashi Sugiyama. Co-teaching: Robust training of deep neural networks with noisy labels. In *Neural Information Processing Systems (NeurIPS)*, 2018.
- **Weihua Hu**, Takeru Miyato, Seiya Tokui, Eiichi Matsumoto and Masashi Sugiyama. Unsupervised Discrete Representation Learning. In **Book Chapter** of *Explainable AI: Interpreting, Explaining and Visualizing Deep Learning. Springer, Cham*, 2019.
- **Weihua Hu**, Gang Niu, Issei Sato and Masashi Sugiyama. Does Distributionally Robust Supervised Learning Give Robust Classifiers? In *International Conference on Machine Learning (ICML)*, 2018.
- Takashi Ishida, Gang Niu, **Weihua Hu** and Masashi Sugiyama. Learning from Complementary Labels. In *Neural Information Processing Systems (NeurIPS)*, 2017.
- **Weihua Hu**, Takeru Miyato, Seiya Tokui, Eiichi Matsumoto and Masashi Sugiyama. Learning Discrete Representations via Information Maximizing Self Augmented Training. In *International Conference on Machine Learning (ICML)*, 2017.
- **Weihua Hu**, Hirosuke Yamamoto and Junya Honda. Worst-Case Redundancy of Optimal Binary AIFV Codes and their Extended Codes. *IEEE Transactions on Information Theory*, vol.63, no.8, pp.5074–5086, August 2017.
- **Weihua Hu**, Hirosuke Yamamoto and Junya Honda. Tight Upper Bounds on the Redundancy of Optimal Binary AIFV Codes. In *IEEE International Symposium on Information Theory (ISIT)*, 2016.

- **Weihua Hu** and Jun'ichi Tsujii. A Latent Concept Topic Model for Robust Topic Inference Using Word Embeddings. In *the annual meeting of the Association for Computational Linguistics (ACL)*, short paper, 2016.

Employment

- **Software Engineer Intern, Kumo.ai** — Mountain View, USA
  Mentors: Jure Leskovec, Hema Raghavan — September 2022 – December 2022
- **Research Intern, DeepMind** — London, UK
  Mentor: Meire Fortunato — June 2022 – September 2022
- **Research Intern, Facebook AI Research** — Menlo Park, CA
  Mentor: Larry Zitnick — June 2020 – September 2020
- **Research Assistant, InfoLab, Stanford** — CA, USA
  Belong to Stanford Network Analysis Project Group led by Jure Leskovec. — September 2018 – Present
- **Research Assistant, AIP Center, RIKEN** — Tokyo, Japan
  Belong to Imperfect Learning Team led by Masashi Sugiyama. — November 2016 – August 2018
- **Research Intern, Preferred Networks** — Tokyo, Japan
  Mentors: Takeru Miyato, Seiya Tokui — August 2016 – September 2016
- **Technical Staff, AI Research Center, AIST** — Tokyo, Japan
  Supervisor: Jun'ichi Tsujii — October 2015 – October 2016
- **Part-time Engineer, Preferred Infrastructure** — Tokyo, Japan
  Belonged to the NLP team. Implemented fast topic models using C++. — November 2015 – March 2016

Invited Talks

- **On the Predictive Power of Graph Neural Networks** — Long Beach, USA
  Dissertation Award Talk at KDD — August 9, 2023
- **On the Predictive Power of Graph Neural Networks** — Tokyo, Japan
  Invited Talk at the University of Tokyo — December 21, 2022
- **Open Graph Benchmark: Large-Scale Challenge** — Stanford, USA
  Invited Talk at Stanford Graph Learning Workshop — September 28, 2022
- **Learning Backward Compatible Embeddings** — Cambridge, UK
  Invited Talk at Cambridge University — September 2, 2022
- **Learning Backward Compatible Embeddings** — Virtual, Hong Kong
  Invited Talk at HKBU — August 4, 2022
- **Open Graph Benchmark: Large-Scale Challenge** — Virtual, China
  Invited Talk at BAAI — June 2, 2022
- **Open Graph Benchmark: Large-Scale Challenge** — MILA, Canada
  Invited Talk at MILA GRL Reading Group — March 3, 2022
- **Open Graph Benchmark: Large-Scale Challenge** — Stanford, USA
  Invited Talk at Stanford Graph Learning Workshop — September 16, 2021
- **Open Graph Benchmark: Large-Scale Challenge** — Virtual, Japan
  Invited Seminar Talk at RIKEN AIP Center — September 2, 2021
- **Advances in GNNs: Expressive Power, Pre-training, and OGB** — KDD
  Invited Short Talk at KDD Deep Learning Day — Auguest 24, 2020
- **Advances in GNNs: Expressive Power, Pre-training, and OGB** — Tokyo, Japan
  Invited Seminar Talk at RIKEN AIP Center — Auguest 5, 2020
- **Advances in GNNs: Expressive Power, Pre-training, and OGB** — London, UK
  Invited Seminar Talk at Twitter Machine Learning Group — June 24, 2020
- **Advances in GNNs: Expressive Power, Pre-training, and OGB** — Hong Kong
  Invited Seminar Talk at 4Paradigm — June 23, 2020

Awards & Funding

- **Forbes 30 under 30 Japan**: (September 2023)
- **KDD Outstanding Doctoral Dissertation Award**: (August 2023)
- **Masason Foundation Fellowship**: (from July 2019 to June 2022)
- **Research Fellowship for Young Scientists (DC1), Japan Society for the Promotion of Science**: (from April 2018)
- **Dean's Award, Graduate School of Information Science and Technology, University of Tokyo**: Best thesis award in the department of Computer Science (2018).
- **Funai Overseas Scholarship** (fellowship for Ph.D. study in the U.S. from September 2018 to August 2020).
- **AIP Challenge Program:** A research funding for excellent young researchers sponsored by JST. 10K USD for half a year. (2016–2017)
- **AIP network lab director award:** Placed 1st for the excellence in the research project conducted in AIP Challenge Program. (2017)

Professional Services

Conference Reviewer: NeurIPS (2019–2021), ICML (2020–2021), ICLR (2021–2022), KDD (2022–2023), ECML-PKDD (2020), ISIT (2020), AAAI (2024), TMLR

Teaching Experiences

- Spring 2023: Guest Lecture at CS224W (Machine Learning with Graphs) at Stanford
- Winter 2021: Teaching Assistant for CS224W (Machine Learning with Graphs) at Stanford
- Fall 2021: Teaching Assistant for CS224W (Machine Learning with Graphs) at Stanford