Hongxu (Danny) Yin

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Google Scholar

Education

Princeton University — New Jersey, USA
Ph.D. in Electrical Computer Engineering — *2015 - 2020*
Research focus: Efficient and Secure Deep Learning
Advisor: Prof. Niraj K. Jha

Nanyang Technological University — Singapore, SG
B.Eng in Electronic & Electronics Engineering (GPA 3.9/4.0, dean's lister all four years) — *2011 - 2015*
Minor in Business (GPA 4.0/4.0)
Advisor: Prof. Bah Hwee Gwee and Prof Zhiping Lin

University of California, Berkeley — California, USA
Undergraduate summer exchange — *2012*

University of Cambridge — Cambridge, UK
High school elite exchange program — *2007*

Academic Experience

NVIDIA, Learning and Perception Research (LPR)
Senior Research Scientist (Team lead: Dr. Jan Kautz) — *May 2022 - Now*

NVIDIA, Learning and Perception Research (LPR)
Research Scientist (Team lead: Dr. Jan Kautz) — *May 2020 - Apr 2022*

NVIDIA, Learning and Perception Research (LPR)
Research Intern (Mentor: Dr. Pavlo Molchanov and Dr. Jan Kautz) — *May 2019 - Nov 2019*

Alibaba U.S., Machine Learning Team
Research Intern (Mentor: Dr. Weifeng Zhang) — *May 2018 - Nov 2018*

Selected Awards

- Forbes Top 60 Elite Chinese North America — *2021*
- Princeton ECE Best Dissertation Award Finalist (Top-3 in department) — *2020*
- Princeton Yan Huo *94 Fellowship (Top-3 in department) — *2019*
- Princeton Natural Science and Foundation Fellowship — *2015-2017*
- Gold Medal - Defense Science and Technology — *2015*
- Gold Medal - Thomas Asia Pacific Holdings — *2015*
- Department Dean's Lister Award — *2011-2015*
- Nanyang Best Industrial Orientation Award — *2014*
- Nanyang Presidential Scholar with Highest Distinction — *2012-2015*

Conference Publications

(*: equal contribution; †: advised intern)

1. **Hongxu Yin**, Arash Vahdat, Jose Alvarez, Arun Mallya, Jan Kautz, Pavlo Molchanov
   A-ViT: Adaptive tokens for efficient vision transformer

Conference on Computer Vision and Pattern Recognition (CVPR), 2022
(**Oral Presentation**)

2. Ali Hatamizadeh*, **Hongxu Yin***, Holger Roth, Wenqi Li, Jan Kautz, Daguang Xu, Pavlo Molchanov
GradViT: Gradient inversion of vision transformers
Conference on Computer Vision and Pattern Recognition (CVPR), 2022

3. Maying Shen, Pavlo Molchanov, **Hongxu Yin**, Jose Alvarez
When to prune? A policy towards early structural pruning
Conference on Computer Vision and Pattern Recognition (CVPR), 2022

4. Xin Dong†, **Hongxu Yin**, Jose Alvarez, Jan Kautz, Pavlo Molchanov
Deep neural networks are surprisingly reversible: A baseline for zero-shot inversion
Conference on Computer Vision and Pattern Recognition Workshop (CVPR Workshop), 2022

5. Ali Hatamizadeh*, **Hongxu Yin***, Holger Roth, Wenqi Li, Jan Kautz, Daguang Xu, Pavlo Molchanov
Gradient inversion of vision transformers
Conference on Computer Vision and Pattern Recognition Workshop (CVPR Workshop), 2022

6. Pavlo Molchanov*, Jimmy Hall*, **Hongxu Yin***, Jan Kautz, Nicolo Fusi, Arash Vahdat
HANT: Hardware-aware network transformation
European Conference on Computer Vision (ECCV), 2022

7. **Hongxu Yin**, Arun Mallya, Arash Vahdat, Jose Alvarez, Jan Kautz, Pavlo Molchanov
See through gradients: Image batch recovery via GradInversion
Conference on Computer Vision and Pattern Recognition (CVPR), 2021

8. Yerlan Idelbayev†, Pavlo Molchanov, Maying Shen, **Hongxu Yin**, M. C. Perpinan, Jose Alvarez
Optimal quantization using scaled codebook
Conference on Computer Vision and Pattern Recognition (CVPR), 2021

9. Akshay Chawla†, **Hongxu Yin**, Pavlo Molchanov, Jose Alvarez
Data-free knowledge distillation for object detection
Winter Conference on Applications of Computer Vision (WACV), 2021

10. **Hongxu Yin**, Arun Mallya, Arash Vahdat, Jose Alvarez, Jan Kautz, Pavlo Molchanov
Dreaming to distill: Data-free knowledge transfer via DeepInversion
Conference on Computer Vision and Pattern Recognition (CVPR), 2020
(**Oral Presentation**)

11. Wenhan Xia, **Hongxu Yin**, Niraj K. Jha
Efficient synthesis of compact deep neural networks
IEEE Design Automation Conference (DAC), 2020

12. Xiaoliang Dai, Peizhao Zhang, Bichen Wu, **Hongxu Yin**, Fei Sun, Yanghan Wang, Marat Dukhan, Yunqing Hu, Yiming Wu, Yangqing Jia, Peter Vajda, Matt Uyttendaele, Niraj K. Jha
ChamNet: Towards efficient network design through platform-aware model adaptation
Conference on Computer Vision and Pattern Recognition (CVPR), 2019

13. Ozge Akmandor, **Hongxu Yin**, and Niraj K. Jha
Simultaneously ensuring smartness, security, and energy efficiency in Internet-of-Things sensors
IEEE Custom Integrated Circuits Conference (CICC), 2017

14. **Hongxu Yin**, Bah Hwee Gwee, Zhiping Lin, Kumar Anil, Galul R. Sirajudeen, and Choo M. S. See
Novel real-time system design for floating-point sub-Nyquist multi-coset signal blind reconstruction
IEEE Int. Symp. on Circuits and Systems (ISCAS), 2015
(**Oral Presentation**)

Journal Publications

15. Shayan Hassantabar, Joe Zhang, **Hongxu Yin**, Niraj K. Jha
MHDeep: Mental health disorder detection system based on body-area and deep neural networks
ACM Transactions on Embedded Computing Systems, 2022

16. **Hongxu Yin**, Guoyang Chen, Yingmin Li, Shuai Che, Weifeng Zhang, and Niraj K. Jha
Hardware-guided symbiotic training for compact, accurate, yet execution-efficient LSTMs
IEEE Trans. Emerging Topics in Computing, 2021

17. Wenhan Xia, **Hongxu Yin**, Xiaoliang Dai, Niraj K. Jha
Fully dynamic inference with deep neural networks
IEEE Trans. Emerging Topics in Computing, 2021

18. Xiaoliang Dai*, **Hongxu Yin***, and Niraj K. Jha
Grow and prune compact, fast, and accurate LSTMs
IEEE Trans. Computers, 2020

19. **Hongxu Yin**, Bilal Mukadam, Xiaoliang Dai, and Niraj K. Jha
DiabDeep: Pervasive diabetes diagnosis based on wearable medical sensors and efficient neural networks
IEEE Trans. Emerging Topics in Computing, 2020

20. Xiaoliang Dai, **Hongxu Yin**, and Niraj K. Jha
Incremental learning using a grow-and-prune paradigm with efficient neural networks
IEEE Trans. Computers, 2020

21. Xiaoliang Dai, **Hongxu Yin**, and Niraj K. Jha
NeST: A neural network synthesis tool based on a grow-and-prune paradigm
IEEE Trans. Computers, 2019

22. **Hongxu Yin**, Zeyu Wang, and Niraj K. Jha
A hierarchical inference model for Internet-of-Things
IEEE Trans. Multi-scale Computing Systems, 2018

23. **Hongxu Yin** and Niraj K. Jha
A health decision support system for disease diagnosis based on wearable medical sensors and machine learning ensembles
IEEE Trans. Multi-scale Computing Systems, 2017

24. Ozge Akmandor, **Hongxu Yin** and Niraj K. Jha
Smart, secure, yet energy-efficient, Internet-of-Things sensors
IEEE Trans. Multi-scale Computing Systems, 2017

Book Chapter

25. **Hongxu Yin**, Ozge Akmandor, Arsalan Mosenia, and Niraj K. Jha
Smart healthcare
Foundations and Trends, 2017

Preprint (under review)

26. Huanrui Yang†, **Hongxu Yin**, Pavlo Molchanov, Hai Li, Jan Kautz
NViT: Vision transformer compression and parameter redistribution
Neural Information Processing Systems (NeurIPS), 2022

27. Maying Shen, **Hongxu Yin**, Pavlo Molchanov, Lei Mao, Jianna Liu, Jose M. Alvarez
Structural pruning via latency-saliency Knapsack
Neural Information Processing Systems (NeurIPS), 2022

28. Ali Hatamizadeh, **Hongxu Yin**, Jan Kautz, Pavlo Molchanov
Global context vision transformer
Neural Information Processing Systems (NeurIPS), 2022

29. Xin Dong†, **Hongxu Yin**, Jose Alvarez, Jan Kautz, Pavlo Molchanov
Deep neural networks are surprisingly reversible: A baseline for zero-shot inversion
British Machine Vision Conference (BMVC), 2022

30. Ali Hatamizadeh, **Hongxu Yin**, Pavlo Molchanov, Andriy Myronenko, Wenqi Li, Prerna Dogra, Andrew Feng, Mona G. Flores, Jan Kautz, Daguang Xu, Holger R. Roth
Do gradient inversion attacks make federated learning unsafe?
IEEE Trans. Biomedical Imaging submission (TMI), 2022

31. Zhen Dong†, **Hongxu Yin**, Arash Vahdat, Jan Kautz, Pavlo Molchanov
Efficient transformation of architectures through hardware-aware nonlinear optimization
Winter Conference on Applications of Computer Vision (WACV), 2022

Invited Keynote & Talk

- *Towards Efficient and Secure Deep Learning*
Invited Keynote, Design Automation Conference (DAC'59) *Jul. 2022*
- *Towards Efficient and Secure Deep Nets*
University of British Columbia ECE Department *May 2022*
- *Inverting Deep Nets*
Princeton University, Department of Computer Science research groups *Aug. 2021*
- *See through Gradients*
Europe ML meeting *Apr. 2021*
- *Dreaming to Distill*
Synced AI (largest AI media in Asia) *Jul. 2020*
- *Dreaming to Distill*
Facebook AR/VR *Jun. 2020*
- *Making Neural Networks Efficient*
Alibaba Cloud / Platform AI group *Feb. 2020*
- *Efficient Neural Networks*
NVIDIA Research, Facebook Research *Dec. 2019*
- *Efficient Neural Networks*
Baidu Research, ByteDance A.I. Lab US *Dec. 2019*
- *Efficient Neural Networks*
Alibaba A.I. Research, Kwai Lab *Nov. 2019*
- *Applied Machine Learning: From Theory to Practice*
Invited Keynote, IEEE Circuits and Systems Society (Singapore Chapter) *Feb. 2018*
- *A Health Decision Support System for Disease Diagnosis*
New Jersey Tech Council *Jun. 2016*

Patents

- *Pruning Vision Transformers under Latency Budget and a Method to Distribute Parameters across Layers*
NVIDIA *2022*
- *GradViT: Gradient Inversion of Vision Transformers*
NVIDIA *2022*

- *Adaptive Token Depth Adjustment Algorithm for Networks with Transformer Blocks*
  NVIDIA *2022*
- *Global Context Model for Transformer Neural Networks*
  NVIDIA *2022*
- *Towards Understanding the Risks of Gradient Inversion in Federated Learning*
  NVIDIA *2022*
- *When to Prune? A Policy for Early Structural Pruning*
  NVIDIA *2021*
- *See Through Gradients: Image Batch Recovery via GradInversion*
  NVIDIA *2021*
- *Network similarity metric as a Pruning Indicator*
  NVIDIA *2021*
- *Zero-shot Model Inversion for Data-free Distillation*
  NVIDIA *2021*
- *MHDeep: Mental Health Disorder Detection System based on Body-Area and Deep Neural Networks*
  Princeton University *2019*
- *Optimal MSE Quantization with Fixed Codebook and Rescaling*
  NVIDIA *2020*
- *Dreaming Data for Continual Learning*
  NVIDIA *2020*
- *Data-Free Knowledge Distillation for Object Detection*
  NVIDIA *2020*
- *Hardware-aware Latency Neural Network Pruning*
  NVIDIA *2020*
- *Image Generation for Data Free Pruning*
  NVIDIA *2019*
- *Hardware-guided Symbiotic Training for Compact, Accurate, yet Execution-efficient LSTMs*
  Alibaba *2019*
- *Incremental Learning using a Grow-and-prune Paradigm with Efficient Neural Networks*
  Princeton University *2019*
- *DiabDeep: Pervasive Diabetes Diagnosis based on Wearable Medical Sensors and Efficient Neural Networks*
  Princeton University *2019*
- *Smart, Secure, yet Energy-efficient Internet-of-Things Sensors*
  Princeton University *2019*
- *NeST: A Neural Network Synthesis Tool based on a Grow-and-prune Paradigm*
  Princeton University *2018*
- *Grow and Prune Compact, Fast, yet Accurate LSTMs*
  Princeton University *2018*
- *A Hierarchical Health Decision support System based on Wearable Medical Sensors and Machine Learning Ensembles*
  Princeton University *2017*

Academic Services

Teaching Assistant - Princeton University

ELE 364, Machine Learning for Predictive Data Analytics *Fall, 17-18*
ELE464, Embedded Computing *Spring, 16-17*

Conference Reviewer & Committee

Computer Vision and Pattern Recognition (CVPR)
International Conference on Computer Vision (ICCV)
Conference on Neural Information Processing Systems (NeurIPS)
International Conference on Machine Learning (ICML)
European Conference on Computer Vision (ECCV)
British Machine Vision Conference (BMVC)
Winter Conference on Applications of Computer Vision (WACV)
AAAI Conference on Artificial Intelligence (AAAI)
Design Automation Conference (DAC)
High-Performance Computer Architecture (HPCA)

Journal Reviewer & Committee

IEEE Transactions on Pattern Analysis and Machine Intelligence
International Journal of Computer Vision
IEEE Journal of Biomedical and Health Informatics
IEEE Journal of Selected Topics in Signal Processing
IEEE Sensors Journal
IEEE Consumer Electronics Magazine
International Journal on Artificial Intelligence Tools
International Journal of Systems Architecture
International Journal of Healthcare Technology and Management
International Journal of Electronic Imaging

Mentorship

Princeton Senior Thesis Mentees

Joe Zhang, now Ph.D. at Stanford *2019-2020*
Hari Santhanam, now Ph.D. at University of Pennsylvania *2019-2020*
Frederick Hertan, now at SIG Trading *2018-2019*
Kyle Johnson, now at Princeton University *2018-2019*
Bilal Mukadam, now at Microsoft *2018-2019*
Chloe Song, now at Astra Inc. *2017-2018*

NVIDIA Research Intern Mentees

Divyam Madaan, New York University *2022-now*
Shixing Yu, University of Texas, Austin *2022-now*
Annamarie Bair, Carnegie Mellon University *2022-now*
Alex Sun, University of Illinois Urbana-Champaign *2022-now*
Huanrui Yang, Duke University *2021-2022*
Zhen Dong, University of California, Berkeley *2021-2022*
Xin Dong, Harvard University *2021-2022*
Paul Micaelli, University of Edingbugh *2021-2022*
Yerlan Idelbayev, University of California, Merced *2020-2021*
Vu Nguyen, Stony Brooks University *2020-2021*
Akshay Chawla, Carnegie Mellon University *2020-2021*