CURRICULUM VITAE SHIWEI LIU

SHIWEI LIU

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EDUCATION

Eindhoven University of Technology (TU/e), The Netherlands *Mar 2018 - April 2022*
Ph.D., Department of Mathematics and Computer Science
w. Cum Laude/Distinguished Dissertations
Promotors: Prof. Dr. Mykola Pechenizkiy; Dr. Decebal Constantin Mocanu

Harbin Institute of Technology, China *Sep 2015 - Jul 2017*
M.Eng, School of Mechanical Engineering and Automation

North University of China, China *Sep 2011 - Jul 2015*
B.Eng., Control Engineering

PROFESSIONAL EXPERIENCE

Royal Society Newton International Fellow *Jan 2024 - Present*
University of Oxford, UK
Mathematical Institute
Host: Prof. Jared Tanner

Postdoctoral Fellow *Sep 2022 - Oct 2023*
University of Texas at Austin (UT Austin), USA
Institute for Foundations of Machine Learning (IFML)
Host: Dr. Zhangyang (Atlas) Wang

Doctoral Researcher *Mar 2018 - Apr 2022*
Eindhoven University of Technology, the Netherlands
Supervisors: Prof. Dr. Mykola Pechenizkiy, Dr. Decebal Constantin Mocanu

RESEARCH INTERESTS

- Low dimensionality in Machine Learning
- Efficient training, scaling, inference, and deployment (with system/hardware co-design)
- Large Language Models (LLMs)
- Trustworthy ML: safety, privacy, and fairness

AWARDS AND HONOURS

- Rising Star in AI, KAUST, Link *01/2024*
- Rising Star Award, Conference on Parsimony and Learning (CPAL), Link *10/2023*
- Best Ph.D. Dissertation Award Runner-Up, Informatics Europe, Link *10/2023*
- Newton International Fellowship Award, Royal Society & British Academy, 8%, Link *09/2023*
- Carnegie Bosch Fellowship, Carnegie Mellon University & Bosch, Link *04/2023*
- Best Paper Award, Learning on Graphs Conference (LoG 2022) *11/2022*
- AAAI-23 Travel Scholarship, USA *12/2022*
- Cum Laude (Distinguished Ph.D. thesis), Eindhoven University of Technology, NL, 5% *4/2022*
- Outstanding Intern, JD Explore Academy, 2% *10/2021*

- The First Class Scholarship, Harbin Institute of Technology, China *07/2017*
- China National Scholarship, China, 0.2% *10/2016*
- The First Class Scholarship, Harbin Institute of Technology, China *07/2016*
- The Outstanding Graduate, North University of China, China *07/2015*

GRANTS (TOTAL: $1,272,177)

- **Newton International Fellowship Award**
Funding Body: Royal Society & British Academy
Value of Award: 394,851 GBP ($481,746)
Duration: January 2024 - January 2027
Role on the Grant: PI

- **NWO Grants for Computing Time**
Funding Body: The Dutch Research Council (NWO)
Value of Award: $90,431.5
Duration: April 2023 - April 2025
Role on the Grant: PI (with Mykola Pechenizkiy and Lu Yin)

- **IFML Postdoctoral Fellowship**
Funding Body: The NSF AI Institute for Foundations of Machine Learning (IFML)
Value of Award: $160,000
Duration: September 2022 - September 2024
Role on the Grant: PI

- **NWO Grants for Computing Time**
Funding Body: The Dutch Research Council (NWO)
Value of Award: $220,000
Duration: April 2022 - April 2024
Role on the Grant: PI (with Mykola Pechenizkiy and Decebal Constantin Mocanu)

- **Carnegie Bosch Fellowships** (declined)
Funding Body: CMU and Bosch
Value of Award: $160,000
Duration: 2023 - 2025
Role on the Grant: PI

INVITED TALKS

- University of Luxembourg. Organizer: Decebal Constantin Mocanu. Jun. 2024
- University of Sheffield. Organizer: Nikolaos Aletras, Cass Zhixue Zhao Jun. 2024
- LTL seminars. University of Cambridge. Organizer: Anna Korhonen, Nigel Collier, and Ivan Vuli Jun. 2024
- CIMDA-Oxford seminars. University of Oxford. Organizer: Coralia Cartis, Terry Lyons Apr. 2024
- Data Science Seminar. University of Oxford. Organizer: Jared Tanner Feb. 2024
- Rising Star in AI Symposium. KAUST. Organizer: Juergen Schmidhuber Feb. 2024
- LIRA Seminar. Lancaster University. Organizer: Plamen Angelov Feb. 2024
- Chinese University of Hong Kong-Shenzhen. Organizer: Ruoyu Sun Jan. 2024
- Rising Star in Cpal Conference. The University of Hong Kong. Organizer: Yi Ma Jan. 2024
- University of Edinburgh. Organizer: Sotirios Tsaftaris Jul. 2023
- Zhidx. Organizer: Zhidx Jul. 2023
- CTSTA Workshop in PLDI 2023. Organizer: Fredrik Kjolstad, Saman Amarasinghe, Michelle Mills Strout Jun. 2023
- EfficientML Reading Group. Organizer: Olga Saukh May. 2023
- Sparsity Reading Group. Organizer: Anna Golubeva , Dan Alistarh, Decebal Constantin Mocanu,

Gintare Karolina Dziugaite, Utku Evci, Yani Ioannou Mar. 2023
• Sharc Group, Organizer: Cong Hao Mar. 2023
• IFML, Organizer: Adam Klivans, Alexandros Dimakis Jan. 2023
• LoG2022 Meetup, Organizer: Jure Leskovec, Kexin Huang Dec. 2022
• NCSU Reliable & Efficient Computing Lab, Organizer: Dongkuan Xu Nov. 2022
• EIC Lab, Organizer: Yingyan Lin Sep. 2022
• AI XinQingNian Nov. 2022
• Data Mining Group, Organizer: Mykola Pechenizkiy May. 2022

EDUCATIONAL AND TEACHING ACTIVITIES

Teaching

• 2IMM00 Seminar Data Mining and AI for MSc, Eindhoven University of Technology Oct. 2023

Tutorial Presentation

• ICASSP 2024, "Sparsity in Large Language Models: The New Odyssey", Seoul, Korea, Apr. 2024
Co-organizer & Presenter; 75-min tutorial presentation on sparsity in Large Language Models (LLMs).
• VITA group workshop, "Sparsity and Efficiency", Austin, USA Sep. 2023
Presenter; 60-min tutorial presentation on recent works on sparse and efficient LLMs.
• IJCAI 2023, "Sparse Training for Supervised, Unsupervised, Continual, and Deep Reinforcement Learning with Deep Neural Networks", Macao, China. Link Aug. 2023
Co-organizer & Presenter; 60-min tutorial presentation from sparse training to sparse scaling.
• ECMLPKDD 2022, "Sparse Neural Network Training", Grenoble, France. Link Sep. 2022
Co-organizer & Presenter; 45-min tutorial presentation on understanding sparse neural network training with supervised learning.

Students (Co)-Mentoring

PhD Students - Research Advisor:
• Lu Yin, Eindhoven University of Technology Dec. 2021 - Current
• Tianjin Huang, Eindhoven University of Technology Dec. 2021 - Current
• Boqian Wu, University of Twente Aug. 2022 - Current
• Qiao Xiao, Eindhoven University of Technology Aug. 2021 - Current
• Ajay Kumar Jaiswal, University of Texas at Austin Sep. 2022 - Current
• Duc N.M Hoang, University of Texas at Austin Sep. 2022 - Current
• Zhenyu Zhang, University of Texas at Austin Sep. 2022 - Current
Master Students - Research Advisor:
• Shu Wang, University of Oxford May. 2024 - Aug. 2024
• Tiansheng Huang, South China University of Technology Jun. 2021 - Dec. 2021
Undergraduate Students - Research Advisor:
• Honors Academy: Simon Sukup, Austin Roose, Angelos Mangos, Mikoaj Pujanek, Eleftheria Kolokytha, Eindhoven University of Technology Nov. 2023 - Present

SERVICE

2024: Conference Reviewer: ICML, ICLR, NeurIPS, AAAI, AISTATS, CPAL
Journal Reviewer: Journal of Selected Topics in Signal Processing, TMLR, TPAMI
2023: Area Chair: ICIP
Conference Reviewer: NeurIPS, ICML, ICLR, CVPR, ICCV, AAAI, UAI, DAC
Journal Reviewer: JMLR, TPAMI, IJCV
2022: Area Chair: ICIP
Conference Reviewer: NeurIPS, ICLR, ICML, CVPR, AAAI
Journal Reviewer: TPAMI
2021: Conference Reviewer: NeurIPS, ICLR, ICML, AISTATS
Journal Reviewer: IEEE Transactions on Evolutionary Computation

2020: Conference Reviewer: ECMLPKDD, IDA
Journal Reviewer: ACM Transactions On Intelligent Systems And Technology

ORGANIZATIONAL CONTRIBUTION

Conference Organization

• Conference on Parsimony and Learning (CPAL), Publicity Chair, Stanford, USA. Mar. 2025
• International Conference on Machine Learning and Applications (ICMLA), Special Sessions Chair, Dec. 2024

Competition Organization

• NeurIPS 2024, "Edge-Device Large Language Model Competition", Vancouver, Canada. May. 2024

Tutorial Organization

• ICASSP 2024, "Sparsity in Large Language Models: The New Odyssey", Seoul, Korea. Apr. 2024
• IJCAI 2023, "Sparse Training for Supervised, Unsupervised, Continual, and Deep Reinforcement Learning with Deep Neural Networks", Macao, China. Link Aug. 2023
• ECMLPKDD 2022, "Sparse Neural Network Training", Grenoble, France. Link Sep. 2022

Meetup Organization

• NeurIPS 2023 Sparsity in Deep Neural Networks Meetup, New Orleans, US. Dec. 2023
• NeurIPS 2023 Local Meetup, Eindhoven University of Technology, the Netherlands. Dec. 2023
• ICLR 2022 Local Meetup, Eindhoven University of Technology, the Netherlands. Apr. 2022

Panellist

• ICASSP 2024, "PROGRESS Workshop", Seoul, Korea. Apr. 2024
• ICASSP 2024, "Deep Neural Network Model Compression Workshop", Seoul, Korea. Apr. 2024

MEDIA COVERAGE

• Press Release of Early Career Research Schemes of Royal Society in Establishing the Next Generation of Research Leaders in the UK. Royal Society. Oct. 2023. Link
• Best Dissertation Award Runner-up Award. Informatics Europe. Oct. 2023. Link
• CPAL Rising Star Award. Conference on Parsimony and Learning (CPAL). Oct. 2023. Link
• Shiwei Liu and VITA Group Receive Best Paper Award at LoG 2022. IFML News. Jan. 2023. Link

PEER REVIEWED PUBLICATIONS

Publication Summary

Overall: **61** papers (27 **A*** and 5 **A** conference paper, CORE Conference Ranking), **7** journal papers; among them **19** first-author papers and **8** last-author papers.
Impact: **1173** citations, h-index: **19**, i10-index: **27** (as of 07-09-2024).

Peer-Reviewed Conference Publications (reverse chronological order)

[1] Adriana Fernandez-Lopez, Honglie Chen, Pingchuan Ma, Lu Yin, Qiao Xiao, Stavros Petridis, **Shiwei Liu**, Maja Pantic. *MSRS: Training Multimodal Speech Recognition Models from Scratch with Sparse Mask Optimization.* Interspeech, 2024

[2] Qiao Xiao, Pingchuan Ma, Adriana Fernandez-Lopez, Boqian Wu, Lu Yin, Stavros Petridis, Mykola Pechenizkiy, Maja Pantic, Decebal Constantin Mocanu, **Shiwei Liu**. *Dynamic Data Pruning for Automatic Speech Recognition.* Interspeech, 2024

[3] Lu Yin, You Wu, Zhenyu Zhang, Cheng-Yu Hsieh, Yaqing Wang, Yiling Jia, Mykola Pechenizkiy, Yi Liang, Zhangyang Wang, **Shiwei Liu.** *Outlier Weighed Layerwise Sparsity (OWL): A Missing Secret Sauce for Pruning LLMs to High Sparsity.* The Forty-first International Conference on Machine Learning (ICML), 2024

[4] Lu Yin, Ajay Jaiswal, **Shiwei Liu**, Souvik Kundu, and Zhangyang Wang. *Pruning Small Pre-Trained Weights Irreversibly and Monotonically Impairs Difficult" Downstream Tasks in LLMs.* The Forty-first International Conference on Machine Learning (ICML), 2024

[5] Yuxin Zhang, Yuxuan Du, Gen Luo, Yunshan Zhong, Zhenyu Zhang, **Shiwei Liu**, Rongrong Ji. *CaM: Cache Merging for Memory-efficient LLMs Inference.* The Forty-first International Conference on Machine Learning (ICML), 2024

[6] Jie Ji, Gen Li, Lu Yin, Minghai Qin, Geng Yuan, Linke Guo, **Shiwei Liu**, Xiaolong Ma. *Advancing Dynamic Sparse Training by Exploring Optimization Opportunities.* The Forty-first International Conference on Machine Learning (ICML), 2024

[7] Zhangheng Li, **Shiwei Liu**, Tianlong Chen, Ajay Kumar Jaiswal, Zhenyu Zhang, Dilin Wang, Raghuraman Krishnamoorthi, Shiyu Chang, Zhangyang Wang. *Sparse Cocktail: Co-Training Many Sparsity Patterns and Ratios at Once.* The Forty-first International Conference on Machine Learning (ICML), 2024

[8] Zhenyu Zhang*, **Shiwei Liu***, Runjin Chen, Bhavya Kailkhura, Beidi Chen, Zhangyang Wang. Q-Hitter: A Better Token Oracle for Efficient LLM Inference via Sparse-Quantized KV Cache. Seventh Conference on Machine Learning and Systems (MLSys), 2024.

[9] Yuxin Zhang, Lirui Zhao, Mingbao Lin, Sun Yunyun, Yiwu Yao, Xingjia Han, Jared Tanner, **Shiwei Liu**, Rongrong Ji. Dynamic Sparse No Training: Training-Free Fine-tuning for Sparse LLMs. The Twelfth International Conference on Learning Representations (ICLR), 2024.

[10] Enneng Yang, Zhenyi Wang, Li Shen, **Shiwei Liu**, Guibing Guo, Xingwei Wang, Dacheng Tao. AdaMerging: Adaptive Model Merging for Multi-Task Learning. The Twelfth International Conference on Learning Representations (ICLR), 2024.

[11] Gen Li, Lu Yin, Jie Ji, Wei Niu, Minghai Qin, Bin Ren, Linke Guo, **Shiwei Liu**, Xiaolong Ma. NeurRev: Train Better Sparse Neural Network Practically via Neuron Revitalization. The Twelfth International Conference on Learning Representations (ICLR), 2024.

[12] Haoyu Ma, Chengming Zhang, Lizhi Xiang, Xiaolong Ma, Geng Yuan, Wenkai Zhang, **Shiwei Liu**, Tianlong Chen, Dingwen Tao, Yanzhi Wang, Zhangyang Wang, Xiaohui Xie. HRBP: Hardware-friendly Regrouping towards Block-wise Pruning for Sparse Training. Conference on Parsimony and Learning (CPAL), 2024 **[Spotlight]**.

[13] Lu Yin, Gen Li, Meng Fang, Li Shen, Tianjin Huang, Zhangyang Wang, Vlado Menkovski, Xiaolong Ma, Mykola Pechenizkiy, **Shiwei Liu**. Dynamic Sparsity Is Channel-Level Sparsity Learner. The Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023. & SNN Workshop at ICLR 2023 **[Spotlight]**.

[14] Jaiswal, Ajay, **Shiwei Liu**, Tianlong Chen, and Zhangyang Wang. *The Emergence of Essential Sparsity in Large Pre-trained Models: The Weights that Matter.* The Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023.

[15] Duc N.M Hoang, Souvik Kundu, **Shiwei Liu**, Zhangyang Wang. Dont just prune by magnitude! Your mask topology is a secret weapon. The Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023.

[16] Hoang Pham, The-Anh Ta, **Shiwei Liu**, Lichuan Xiang, Dung D. Le, Hongkai Wen, Long Tran-Thanh. *Towards Data-Agnostic Pruning At Initialization: What Makes a Good Sparse Mask?* The Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023.

[17] Enneng Yang, Li Shen, Zhenyi Wang, **Shiwei Liu**, Guibing Guo, Xingwei Wang. *Data Augmented Flatness-aware Gradient Projection for Continual Learning.* International Conference on Computer Vision (ICCV), 2023.

[18] Ruisi Cai, Xiaohan Chen, **Shiwei Liu**, Jayanth Srinivasa, Myungjin Lee, Ramana Rao Kompella, Zhangyang Wang. *Scaling Federated Learning under Data and Task Heterogeneity: A Pilot Study.* International Conference on Computer Vision (ICCV), MTLFL FedVision Workshop 2023.

[19] Tianjin Huang*, **Shiwei Liu***, Tianlong Chen, Meng Fang, Li Shen, Vlado Menkovski, Lu Yin, Yulong Pei, Mykola Pechenizkiy. *Enhancing Adversarial Training via Reweighting Optimization Trajectory.* The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD), 2023.

[20] Jiaxu Zhao, Lu Yin, **Shiwei Liu**, Meng Fang, Mykola Pechenizkiy. *REST: Debiasing Deep Neural Networks through Reweighted Sparse Training.* The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD), 2023.

[21] Ajay Kumar Jaiswal, **Shiwei Liu**, Tianlong Chen, Ying Ding, Zhangyang Wang. *Instant Soup: Cheap Pruning Ensembles in A Single Pass Can Draw Lottery Tickets from Large Models.* The Fortieth International Conference on Machine Learning (ICML), PMLR, 2023. **[Oral]**.

[22] Tianjin Huang, Lu Yin, Zhenyu Zhang, Li Shen, Meng Fang, Mykola Pechenizkiy, Zhangyang Wang, **Shiwei Liu**. *Are Large Kernels Better Teachers than Transformers for ConvNets?*. The Fortieth International Conference on Machine Learning (ICML), PMLR, 2023.

[23] Ajay Kumar Jaiswal, **Shiwei Liu**, Tianlong Chen, Ying Ding, Zhangyang Wang. *Graph Ladling: Embarrassingly Scalable and Efficient Training of Powerful GNNs via Data-Centric Model Averaging.* The Fortieth International Conference on Machine Learning (ICML), PMLR, 2023.

[24] **Shiwei Liu**, Tianlong Chen, Xiaohan Chen, Xuxi Chen, Qiao Xiao, Boqian Wu, Mykola Pechenizkiy, Decebal Mocanu, and Zhangyang Wang. *More Convnets in the 2020s: Scaling Up Kernels Beyond 51×51 Using Sparsity.* International Conference on Learning Representations (ICLR), 2023.

[25] Duc N.M Hoang, **Shiwei Liu**, Radu Marculescu, Zhangyang Wang. *Revisiting Pruning at Initialization Through the Lens of Ramanujan Graph.* International Conference on Learning Representations (ICLR), 2023. **[Oral]**.

[26] **Shiwei Liu***, Tianlong Chen*, Zhenyu Zhang, Xuxi Chen, Tianjin Huang, Ajay Kumar Jaiswal, and Zhangyang Wang. *Sparsity May Cry: Let Us Fail (Current) Sparse Neural Networks Together!.* International Conference on Learning Representations (ICLR), 2023. **[Spotlight]**.

[27] Tianlong Chen, Zhenyu Zhang, Ajay Kumar Jaiswal, **Shiwei Liu**, Zhangyang Wang *Sparse MoE with Random Routing as the New Dropout: Training Bigger and Self-Scalable Models.* International Conference on Learning Representations (ICLR), 2023. **[Spotlight]**.

[28] **Shiwei Liu**, and Zhangyang Wang., 2023. *Ten Lessons We Have Learned in the New "Sparseland": A Short Handbook for Sparse Neural Network Researchers.* SNN Workshop at ICLR 2023. **[Spotlight]**.

[29] Lu Yin*, **Shiwei Liu***, Fang Meng, Tianjin Huang, Vlado Menkovski, Mykola Pechenizkiy. *Lottery Pools: Winning More by Interpolating Tickets without Increasing Training or Inference Cost.* Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI), 2023.

[30] Tianjin Huang, Tianlong Chen, Meng Fang, Vlado Menkovski, Jiaxu Zhao, Lu Yin, Yulong Pei, Decebal Constantin Mocanu, Zhangyang Wang, Mykola Pechenizkiy, **Shiwei Liu**. *You Can Have Better Graph Neural Networks by Not Training Weights at All: Finding Untrained Graph Tickets.* Learning on Graphs Conference (LoG), 2022. **[Oral & Best Paper Award]**.

[31] Qiao Xiao, Boqian Wu, Yu Zhang, **Shiwei Liu**, Mykola Pechenizkiy, Elena Mocanu, Decebal Constantin Mocanu. *Dynamic Sparse Network for Time Series Classification: Learning What to See.* The Thirty-sixth Conference on Neural Information Processing Systems (NeurIPS), 2022.

[32] Lu Yin, Vlado Menkovski, Meng Fang, Tianjin Huang, Yulong Pei, Mykola Pechenizkiy, **Shiwei Liu**. *Superposing Many Tickets into One: A Performance Booster for Sparse Neural Network Training.* The 38th Conference on Uncertainty in Artificial Intelligence (UAI), 2022.

[33] **Shiwei Liu**, Tianlong Chen, Xiaohan Chen, Li Shen, Decebal Constantin Mocanu, Zhangyang Wang, and Mykola Pechenizkiy. *The Unreasonable Effectiveness of Random Pruning: Return of the Most Naive Baseline for Sparse Training.* International Conference on Learning Representations (ICLR), 2022.

[34] **Shiwei Liu**, Tianlong Chen, Zahra Atashgahi, Xiaohan Chen, Ghada Sokar, Elena Mocanu, Mykola Pechenizkiy, Zhangyang Wang, and Decebal Constantin Mocanu. *Deep Ensembling with No Overhead for either Training or Testing: The All-Round Blessings of Dynamic Sparsity.* International Conference on Learning Representations (ICLR), 2022.

[35] **Shiwei Liu**, Tianlong Chen, Xiaohan Chen, Zahra Atashgahi, Lu Yin, Huanyu Kou, Li Shen, Mykola Pechenizkiy, Zhangyang Wang, and Decebal Constantin Mocanu. *Sparse Training via Boosting Pruning Plasticity with Neuroregeneration.* The Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS), 2021.

[36] **Shiwei Liu**, Lu Yin, Decebal Constantin Mocanu, and Mykola Pechenizkiy. *Do We Actually Need Dense Over-Parameterization? In-Time Over-Parameterization in Sparse Training.* The Thirty-eighth International Conference on Machine Learning (ICML), PMLR, 2021.

[37] **Shiwei Liu**, Decebal Constantin Mocanu, Yulong Pei, and Mykola Pechenizkiy. *Selfish sparse RNN training.* The Thirty-eighth International Conference on Machine Learning (ICML), PMLR, 2021.

[38] **Shiwei Liu**, Tim Van der Lee, Anil Yaman, Zahra Atashgahi, Davide Ferraro, Ghada Sokar, Mykola Pechenizkiy, and Decebal Constantin Mocanu. *Topological Insights into Sparse Neural Networks.* The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD), Ghent, Belgium, 2020.

[39] **Shiwei Liu**. *Learning Sparse Neural Networks for Better Generalization.* 29^{th} International International Joint Conference on Artificial Intelligence (IJCAI), 2020. Doctoral Consortium.

[40] **Shiwei Liu**, Decebal Constantin Mocanu, and Mykola Pechenizkiy. *On improving deep learning generalization with adaptive sparse connectivity.* The Workshop of Understanding and Improving Generalization in Deep Learning, The Thirty-sixth International Conference on Machine Learning (ICML), PMLR, 2019.

[41] Yan, Fulong, **Shiwei Liu**, and Nicola Calabretta. *Network Performance Optimization with Real Time Traffic Prediction in Data Center Network.* 2020 European Conference on Optical Communications (ECOC). IEEE, 2020.

Peer-Reviewed Journal Publications

[42] **Shiwei Liu**, Yuesong Tian, Tianlong Chen, Li Shen. *Don't Be So Dense: Sparse-to-Sparse GAN Training Without Sacrificing Performance.* International Journal of Computer Vision (IJCV).

[43] Zahra Atashgahi, Xuhao Zhang, Neil Kichler, **Shiwei Liu**, Lu Yin, Mykola Pechenizkiy, Raymond Veldhuis, Decebal Constantin Mocanu. *Feature Selection with Neuron Evolution.*, TMLR. 2023.

[44] Zahra Atashgahi, Joost Pieterse, **Shiwei Liu**, Decebal Constantin Mocanu, Raymond Veldhuis, Mykola Pechenizkiy. *A Brain-inspired Algorithm for Training Highly Sparse Neural Networks.* Machine Learning Journal (ECML-PKDD 2022 journal track).

[45] **Shiwei Liu**, Decebal Constantin Mocanu, Amarsagar Reddy Ramapuram Matavalam, Yulong Pei, and Mykola Pechenizkiy. (2021). *Sparse evolutionary deep learning with over one million artificial neurons on commodity hardware.* Neural Computing and Applications, 1-16.

[46] **Shiwei Liu**, Iftitahu Nimah, Vlado Menkovski, Decebal Constantin Mocanu, and Mykola Pechenizkiy. (2021). *Efficient and effective training of sparse recurrent neural networks.* Neural Computing and Applications, 1-12.

Pre-print and Under-Review

[47] Abhinav Bandari, Lu Yin, Cheng-Yu Hsieh, AJAY KUMAR JAISWAL, Tianlong Chen, Li Shen, Ranjay Krishna, **Shiwei Liu**. *Is C4 Dataset Enough for Pruning? An Investigation of Calibration Data for LLM Pruning.* Under Review.

[48] AJAY KUMAR JAISWAL, Bodun Hu, Lu Yin, Yeonju Ro, **Shiwei Liu**, Tianlong Chen, Aditya Akella. *FFN-SkipLLM: A Hidden Gem for Autoregressive Decoding with Adaptive Feed Forward Skipping .* Under Review.

[49] Pengxiang Li, Lu Yin, Xiaowei Gao, **Shiwei Liu**. *OwLore: Outlier-weighed Layerwise Sampled Low-Rank Projection for Memory-Efficient LLM Fine-tuning.* Under Review.

[50] Huang, Tianjin and Meng, Fang and Shen, Li and Liu, Fan and Pei, Yulong and Pechenizkiy, Mykola and **Shiwei Liu** and Chen, Tianlong. *(PASS) Visual Prompt Locates Good Structure Sparsity through a Recurrent HyperNetwork.* Under Review.

[51] Ajay Jaiswal, Lu Yin, Zhenyu Zhang, **Shiwei Liu**, Jiawei Zhao, Yuandong Tian, Zhangyang Wang. *From GaLore to WeLore: How Low-Rank Weights Non-uniformly Emerge from Low-Rank Gradients.* Under Review.

[52] Zhenyu Zhang, Ajay Jaiswal, Lu Yin, **Shiwei Liu**, Jiawei Zhao, Yuandong Tian, Zhangyang Wang. *Q-GaLore: Quantized GaLore with INT4 Projection and Layer-Adaptive Low-Rank Gradients.* Under Review.

[53] Anke Tang, Li Shen, Yong Luo, **Shiwei Liu**, Han Hu, Bo Du, Dacheng Tao. *Data-Adaptive Weight-Ensembling for Multi-Task Model Fusion.* Under Review.

[54] Haiquan Lu, Yefan Zhou, **Shiwei Liu**, Elicia Ye, Alex Zhao, Zhangyang Wang, Michael W. Mahoney. *AlphaPruning: Using Heavy-Tailed Self Regularization Theory for Improved Layer-wise Pruning of Large Language Models.* Under Review.

[55] Arinbjrn Kolbeinsson, Tianjin Huang, Shanghua Gao, **Shiwei Liu**, Jonathan Richard Schwarz, Anurag Jayant Vaidya, Faisal Mahmood, Marinka Zitnik, Tianlong Chen, Thomas Hartvigsen. *Composable Interventions for Language Models.* Under Review.

[56] Zhenyu Zhang, Runjin Chen, **Shiwei Liu**, Zhewei Yao, Olatunji Ruwase, Beidi Chen, Xiaoxia Wu, Zhangyang Wang. *Found in the Middle: How Language Models Use Long Contexts Better via Plug-and-Play Positional Encoding.* Under Review.

[57] Boqian Wua, Qiao Xiaob, **Shiwei Liu**, Lu Yin, Mykola Pechenizkiy, Decebal Constantin Mocanu, Maurice Van Keulen, Elena Mocanu. *E2ENet: Dynamic Sparse Feature Fusion for Accurate and Efficient 3D Medical Image Segmentation.* Under Review.

[58] Tianjin Huang, Tianlong Chen, Zhangyang Wang, **Shiwei Liu**. *The Counterattack of CNNs in Self-Supervised Learning: Larger Kernel Size Might be All You Need.* Under Review.

[59] Tiansheng Huang, **Shiwei Liu**, Li Shen, Fengxiang He, Weiwei Lin, Dacheng Tao., 2022. *Achieving Personalized Federated Learning with Sparse Local Models. arXiv preprint arXiv:2201.11380.*

[60] Yin Nan, Li Shen, Mengzhu Wang, **Shiwei Liu**, Chong Chen, Xian-Sheng Hua, Xiao Luo. *SPORT: A Subgraph Perspective on Graph Classification with Label Noise.* Under Review.

Ph.D. Thesis

[61] **Shiwei Liu**. Sparse Neural Network Training with In-Time Over-Parameterization. The Eindhoven University of Technology. 2022. Paper