

ABOUT ME

Hi, I'm Lu, an Assistant Professor at the **University of Surrey** and a long-term Visiting Researcher at **Eindhoven University of Technology**. My primary research mainly focus is on understanding and building **Efficiency and Scalability of AI models**. I believe that passion and persistence are the keystones of groundbreaking research, and I am committed to delivering research of unparalleled quality.

RESEARCH INTERESTS

AI Efficiency # LLM # Computer Vision # ML/DL # AI Interdisciplinary Applications

PROFESSIONAL EXPERIENCE

- University of Surrey
06/2024 – Present
 - Google, New York Office
07/2023 – 09/2023
 - Eindhoven University of Technology
07/2023 – 11/2023
- Assistant Professor**

 - Nature Inspired Computing and Engineering Group

AI Researcher (Intern)

 - Build efficient large language models (LLM)

Postdoctoral Researcher

 - Department of Mathematics and Computer Science

EDUCATION

- Eindhoven University of Technology
10/2018 - 2/2023
 - Harbin Institute of Technology (Shenzhen)
09/2015 - 07/2018
 - Harbin Institute of Technology
09/2009 - 07/2013
- Ph.D in Computer Science**

Department: Mathematics and Computer Science

Specialization: Knowledge Elicitation, Data Efficiency, Model Efficiency

Promoters: Prof. Dr. Mykola Pechenizkiy; Dr. Vlado Menkovski

Master in Control Engineering

Department: Mechanical Engineering and Automation

Specialization: Computer Vision, Robotics

Promoters: Prof. Dr.Xiaorui Zhu

Bachelor in Electrical Engineering and Automation

Department: Information and Electrical Engineering

AWARDS AND HONOURS

- 12/2022 Best Paper Award at Learning on Graphs Conference (LoG). 2022.
- 06/2017 Best Paper Nomination Award at International Conference on Computer Vision Systems (ICVS), 2017

GRANT

NeurIPS 2024 Challenge: Edge-Device Large Language Model Competition

- Funding Body: Huawei
- Value of Award: 70,000 \$
- Duration: June 2024 - December 2025
- 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: Co-pi (with Mykola Pechenizkiy and Shiwei Liu)

SUPERVISION ACTIVITIES

Ph.D Projects

- Model Compression.
Andi Li, *University of Aberdeen*, 2024
- Robustness of Large Foundation Models
Kappiyath, Adarsh, *University of Surrey*, 2024
- Resource Efficient 3D World Understanding
Thengane, Vishal, *University of Surrey*, 2024

BSc Projects

- Hyperbolic NN within Incremental Learning
Ben Laurie, *University of Aberdeen*, 2024

MSc Projects

- Automated Object Recognition in Aerial Photographs.
Judith te Selle, *Eindhoven University of Technology*, 2022
- Aspect-based Few-shot Learning.
Phuong Trinh, *Eindhoven University of Technology*, 2022
- Impact of Parameter Sharing in Sparse Neural Networks.
Pritham Raaj Kishore Anand, *University of Aberdeen*, 2024
- Adaptive Augmentation in Latent Space using Autoencoders.
Nikhila Ramisett, *University of Aberdeen*, 2024

TEACHINGS

- | | | |
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| • Deep Learning (2AMM10), Eindhoven University of Technology | ----- | 2020 |
| • Deep Learning (2AMM10), Eindhoven University of Technology | ----- | 2021 |
| • Deep Learning (2AMM10), Eindhoven University of Technology | ----- | 2023 |
| • Applied Artificial Intelligence (CS5079), University of Aberdeen | ----- | 2024 |
| • Data Mining and Deep Learning (CS552J), University of Aberdeen | ----- | 2024 |
| • Practical Business Analytics (Com3018), University of Surrey | ----- | 2024 |

RESEARCH ACTIVITIES

Talks:

- Going beyond training ML models with labels at EDGE AI, Eindhoven University of Technology, 2020
- Model/supervision Efficiency at Xu Lab, Carnegie Mellon University, 2022
- LLM pruning, Visual Informatics Group @ University of Texas at Austin, 2023
- The power of model sparsity, Multimedia Analytics (MA) Laboratory at City University of Hong Kong, 2024

Conference Program Committee Member/Reviewer:

- NeurIPS, ICML, CVPR, UAI, DAC, SNN workshop. Reviewer.
- The European Conference on Machine Learning (ECML) [2020]. Session chair.

Organizational Contribution

- Co-organize NeurIPS 2024 Challenge: Edge-Device Large Language Model Competition

RESEARCH & SELECTED PUBLICATION

Overall: (as of September 2024)

- 37 papers (12 A* and 5 A top AI conference papers, CORE Conference Ranking), 1 Journal Paper

Highlights:

- 1 Best Paper Award, 1 Best Paper Nomination Award.
- 5 ICML, 3 Neurips, 2 EMNLP, 1 BMVC, 1 ICLR, 1 AAAI, 1 UAI.

Selected Publications

- Lu Yin, You Wu, .etc. *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
- Lu Yin, Ajay Jaiswal, .etc. *Pruning Small Pre-Trained Weights Irreversibly and Monotonically Impairs "Difficult" Downstream Tasks in LLMs*. The Forty-first International Conference on Machine Learning (ICML), 2024
- Jie Ji, Gen Li, Lu Yin, .etc. *BiDST: Dynamic Sparse Training is a Bi-Level Optimization Problem*. The Forty-first International Conference on Machine Learning (ICML), 2024
- Lu Yin, Gen Li, Meng Fang, Li Shen, Tianjin Huang, Zhangyang Wang, Vlado Menkovski, Xiaolong Ma, Mykola Pechenizkiy, Shiwei Liu. *Dynamic Sparse Training Is also A Structure Sparsity Learner*. Conference on Neural Information Processing Systems (NeurIPS), 2023
- 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-Seventh AAAI Conference on Artificial Intelligence (AAAI), 2023.
- Lu Yin, Vlado Menkovski, Meng Fang, Tianjin, Huang, Yulong Pei, Mykola Pechenizkiy, Decebal Constantin Mocanu, 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.
- 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.
- 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?* International Conference on Machine Learning (ICML), 2023.

- Qiao Xiao, Boqian Wu, **Lu Yin**, Christopher Neil Gadzinski, Tianjin Huang, Mykola Pechenizkiy, Decebal Constantin Mocanu. *Are Sparse Neural Networks Better Hard Sample Learners?* Conference on British Machine Vision Conference. (**BMVC**), 2024
- Boqian Wu, Qiao Xiao, Shiwei Liu, **Lu Yin**, etc. *E2ENet: Dynamic Sparse Feature Fusion for Accurate and Efficient 3D Medical Image Segmentation*. Conference on Neural Information Processing Systems (**NeurIPS**), 2024
- AJAY KUMAR JAISWAL, **Lu Yin**, etc, *FFN-SkipLLM: A Hidden Gem for Autoregressive Decoding with Adaptive Feed Forward Skipping*, Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2024
- Abhinav Bandari, **Lu Yin**, etc, *FFN-SkipLLM: Is C4 Dataset Enough for Pruning? An Investigation of Calibration Data for LLM Pruning*, Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2024
- 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
- 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
- Zahra Atashgahi, Xuhao Zhang, Neil Kichler, Shiwei Liu, **Lu Yin**, Mykola Pechenizkiy, Raymond Veldhuis, Decebal Constantin Mocanu. *Supervised Feature Selection with Neuron Evolution in Sparse Neural Networks*. Transactions on Machine Learning Research (**TMLR**).
- 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 GNNs Tickets*. Learning on Graphs Conference (**LoG**). 2022. (**BEST PAPER AWARD**)
- **Lu Yin**, Vlado Menkovski, Mykola Pechenizkiy. *Knowledge Elicitation using Deep Metric Learning and Psychometric Testing*. The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD**), Ghent, Belgium, 2020.
- Jiaxu Zhao*, **Lu Yin***, Shiwei Liu, Fang Meng. 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**). Turin, Italy, 2023. *equal contribution
- 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**). Turin, Italy, 2023.
- **Lu Yin**. *Beyond Labels: Knowledge Elicitation using Deep Metric Learning and Psychometric Testing*. 29th International Joint Conference on Artificial Intelligence-17th Pacific Rim International Conference on Artificial Intelligence (**IJCAI DC**), 2020. Doctoral Consortium.
- **Lu Yin**, Vlado Menkovski, Shiwei Liu, and Mykola Pechenizkiy. *Hierarchical Semantic Segmentation using Psychometric Learning*. The Thirteenth Asian Conference on Machine Learning (**ACML**), 2021. (**LONG ORAL**)
- **Lu Yin**, Vlado Menkovski, Yulong Pei, and Mykola Pechenizkiy. *Semantic-Based Few-Shot Learning by Interactive Psychometric Testing*. The Workshop on Interactive Machine Learning. The Thirty-Sixth AAAI Conference on Artificial Intelligence (**AAAI Workshop**), 2022
- **Lu Yin**, Vlado Menkovski, Yulong Pei, and Mykola Pechenizkiy. *Semantic-Based Few-Shot Learning by Psychometric Testing*. International Symposium on Intelligent Data Analysis (**IDA**). Springer, Cham, 2022.
- Fucheng Deng, Xiaorui Zhu, **Lu Yin**, Chao H, *Real-Time Detection of Polygons and Circles Based on Semantics*. 2018 IEEE International Conference on Information and Automation (**ICIA**). IEEE, 2018: 444-449.
- Xiaorui Zhu, **Lu Yin**, Fucheng Deng. *Wind Disturbance Rejection in Position Control of Unmanned Helicopter by Nonlinear Damping*. International Conference on Computer Vision Systems (**ICVS**). Springer, Cham, 2017: 590-599. (**BEST PAPER NOMINEES AWARD**)

More in: <https://scholar.google.com/citations?user=G4Xe1NkAAAAJ>