Yawei Li

Curriculum Vitae

Computer Vision Lab
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My Homepage
Citation 3112 *Github* *Linkedin*

Experience

12/2023-now **Lecturer, ETH Zürich** **Zürich, Switzerland**
Department of Information Technology and Electrical Engineering (D-ITET)
- Algorithm: Computer Vision Lab. Host Prof. Luc Van Gool
- Hardware: Integrated System Lab. Host: Prof. Luca Benini
- Edge device: Center for Project-Based Learning. Host: Dr. Michele Magno

04/2022-11/2023 **Postdoctoral Researcher, ETH Zürich** **Zürich, Switzerland**
Department of Information Technology and Electrical Engineering (D-ITET)

Education

09.2017–03.2022 **PhD, ETH Zürich** **Zürich, Switzerland**
Department of Information Technology and Electrical Engineering (D-ITET)
- Computer Vision Lab
- Thesis: Towards Efficient Deep Neural Networks
- Supervisor: Prof. Luc Van Gool, Co-supervisor: Prof. Radu Timofte
- Committee: Luc Van Gool, Thomas Brox, Ming-Hsuan Yang, Radu Timofte

2014–2017 **Master, University of Electronic Science and Technology of China** **Chengdu, China**
Department of Communication Engineering, Communication and Information System

2010–2014 **Bachelor, University of Electronic Science and Technology of China** **Chengdu, China**
Department of Communication Engineering, Communication Engineering, Finance (Dual degree)

Industrial Corporation

09.2021–12.2021 **Reality Lab, Meta** **Seattle, the U.S.**
Conducting research in artificial intelligence, image restoration, and generative AI; published two papers
- LSDIR: A large scale dataset for image restoration, CVPR workshop, 2023
- Efficient and explicit modelling of image hierarchies for image restoration, CVPR, 2023

03–07/2021 **Qualcomm AI Research** **Amsterdam, the Netherlands**
Obtained a US patent as the first contributor
- Processing video content using gated transformer neural networks (Patent No. 20230090941)

Research Interests

- **Efficient AI neural network design:** efficient deep learning models, vision transformers, graph neural networks, convolutional neural networks, spiking neural networks
- **Efficient AI algorithm:** network pruning, network quantization, low-rank approximation, knowledge distillation, neural architecture search
- **Efficient AI hardware and systems:** software-hardware co-design, MCU, SoC, AIoT, event camera, smart camera, quadruped robot
- **Application and task:** visual recognition, object detection, image restoration, medical image reconstruction and enhancement, AR/VR

Selected Awards

2022 **DAAD AInet Fellow**, German Academic Exchange Service, Germany

07.2019 **Best Poster Presentation Award**, International Computer Vision Summer School, Sicily, Italy

09.2018 **Runner-up Award in PIRM 2018 Challenge**, Workshop and Challenge on Perceptual Image Restoration and Manipulation, European Conference on Computer Vision, Munich, Germany

12.2016 **National Scholarship**, Ministry of Education of China

11.2016 **Tang Lixin Scholarship**, University of Electronic Science and Technology of China

12.2015 **National Scholarship**, Ministry of Education of China

12.2013 **National Scholarship**, Ministry of Education of China

Teaching

2023 Fall **227-0085-11L: Deep Learning for Image Manipulation. Lecturer.** *Bachelor course*

2020 Fall **227-0085-11L: Deep Learning for Image Manipulation. Teaching assistant.** *Bachelor course*

2017-2019 Fall **263-5902-00L: Computer Vision. Teaching assistant.** *Master course*

Publication

Peer-Reviewed Conference Papers

[1] Leheng Zhang, **Yawei Li**, Xingyu Zhou, Xiaorui Zhao, and Shuhang Gu. "Transcending the Limit of Local Window: Advanced Super-Resolution Transformer with Adaptive Token Dictionary". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2024

[2] **Yawei Li**, Kai Zhang, Jiezhang Cao, Radu Timofte, Michele Magno, Luca Benini, and Luc Van Gool. "LocalViT: Analyzing Locality in Vision Transformers". In: *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*. 2023

[3] Pietro Bonazzi, Thomas Ruegg, Sizhen Bian, **Yawei Li**, and Michele Magno. "TinyTracker: Ultra-Fast and Ultra-Low-Power Edge Vision for In-Sensor Gaze Estimation". In: *Proceedings of IEEE Sensors*. 2023

[4] **Yawei Li**, Yuchen Fan, Xiaoyu Xiang, Denis Demandolx, Rakesh Ranjan, Radu Timofte, and Luc Van Gool. "Efficient and explicit modelling of image hierarchies for image restoration". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2023, pp. 18278–18289

[5] Jiezhang Cao, Qin Wang, Yongqin Xian, **Yawei Li**, Bingbing Ni, Zhiming Pi, Kai Zhang, Yulun Zhang, Radu Timofte, and Luc Van Gool. "Ciaosr: Continuous implicit attention-in-attention network for arbitrary-scale image super-resolution". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2023, pp. 1796–1807

[6] **Yawei Li**, Kai Zhang, Jingyun Liang, Jiezhang Cao, Ce Liu, Rui Gong, Yulun Zhang, Hao Tang, Yun Liu, Denis Demandolx, et al. "LSDIR: A large scale dataset for image restoration". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops*. 2023, pp. 1775–1787

[7] Xinchen Gao, **Yawei Li**, Wen Li, Lixin Duan, Luc Van Gool, Luca Benini, and Michele Magno. "Learning continuous piecewise non-linear activation functions for deep neural networks". In: *2023 IEEE International Conference on Multimedia and Expo (ICME)*. IEEE. 2023, pp. 1835–1840

[8] Jiezhang Cao, Jingyun Liang, Kai Zhang, **Yawei Li**, Yulun Zhang, Wenguan Wang, and Luc Van Gool. "Reference-based image super-resolution with deformable attention transformer". In: *European conference on computer vision*. Springer. 2022, pp. 325–342

[9] **Yawei Li**, Kamil Adamczewski, Wen Li, Shuhang Gu, Radu Timofte, and Luc Van Gool. "Revisiting Random Channel Pruning for Neural Network Compression". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2022

[10] **Yawei Li**, Babak Ehteshami Bejnordi, Bert Moons, Tijmen Blankevoort, Amirhossein Habibian, Radu Timofte, and Luc Van Gool. "Spatio-Temporal Gated Transformers for Efficient Video Processing". In: *Advances in Neural Information Processing Systems Workshops*. 2021

[11] **Yawei Li**, He Chen, Zhaopeng Cui, Radu Timofte, Marc Pollefeys, Gregory Chirikjian, and Luc Van Gool. "Towards Efficient Graph Convolutional Networks for Point Cloud Handling". In: *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2021

[12] **Yawei Li**, Wen Li, Martin Danelljan, Zhang Kai, Shuhang Gu, Luc Van Gool, and Radu Timofte. "The Heterogeneity Hypothesis: Finding Layer-Wise Differentiated Network Architectures". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2021

[13] Yunxuan Wei, Shuhang Gu, **Yawei Li**, Radu Timofte, Longcun Jin, and Hengjie Song. "Unsupervised Real-world Image Super Resolution via Domain-distance Aware Training". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2021

[14] Rui Gong, Yuhua Chen, Danda Pani Paudel, **Yawei Li**, Ajad Chhatkuli, Wen Li, Dengxin Dai, and Luc Van Gool. "Cluster, Split, Fuse, and Update: Meta-Learning for Open Compound Domain Adaptive Semantic Segmentation". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2021

[15] **Yawei Li**, Shuhang Gu, Kai Zhang, Luc Van Gool, and Radu Timofte. "DHP: Differentiable Meta Pruning via HyperNetworks". In: *Proceedings of the European Conference on Computer Vision*. 2020

[16] **Yawei Li**, Shuhang Gu, Christoph Mayer, Luc Van Gool, and Radu Timofte. "Group Sparsity: The Hinge Between Filter Pruning and Decomposition for Network Compression". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2020

[17] **Yawei Li**, Shuhang Gu, Luc Van Gool, and Radu Timofte. "Learning Filter Basis for Convolutional Neural Network Compression". In: *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2019

[18] Shuhang Gu, **Yawei Li**, Luc Van Gool, and Radu Timofte. "Self-Guided Network for Fast Image Denoising". In: *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2019

[19] **Yawei Li**, Vagia Tsiminaki, Radu Timofte, Marc Pollefeys, and Luc Van Gool. "3D Appearance Super-Resolution with Deep Learning". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2019, pp. 9671–9680

[20] **Yawei Li**, Eirikur Agustsson, Shuhang Gu, Radu Timofte, and Luc Van Gool. "CARN: convolutional anchored regression network for fast and accurate single image super-resolution". In: *Proceedings of the European Conference on Computer Vision Workshops*. Springer. 2018, pp. 166–181

[21] **Yawei Li**, Xiaofeng Li, Zhizhong Fu, and Wenli Zhong. "Multiview Video Super-Resolution via Information Extraction and Merging". In: *Proceedings of the ACM International Conference on Multimedia*. ACM. 2016, pp. 446–450

[22] **Yawei Li**, Xiaofeng Li, Zhizhong Fu, Xiuxia Yin, and Yufei Zhao. "Bilateral video super-resolution using non-local means with adaptive parameters". In: *Proceedings of the IEEE International Conference on Image Processing*. IEEE. 2016, pp. 1155–1159

[23] Gang Chen, **Yawei Li**, and Sargur N Srihari. "Joint visual denoising and classification using deep learning". In: *Proceedings of the IEEE International Conference on Image Processing*. IEEE. 2016, pp. 3673–3677

[24] **Yawei Li**, Xiaofeng Li, Zhizhong Fu, Tingting Niu, and Keyu Long. "Spatiotemporal super-resolution for multiview video in transform domain". In: *Proceedings of Visual Communications and Image Processing*. IEEE. 2016, pp. 1–4

Peer-Reviewed Journal Papers

[1] Jingyun Liang, Jiezhang Cao, Yuchen Fan, Kai Zhang, Rakesh Ranjan, **Yawei Li**, Radu Timofte, and Luc Van Gool. "VRT: A Video Restoration Transformer". In: *IEEE Transactions on Image Processing* (2024), pp. 1–1

[2] Kai Zhang, **Yawei Li**, Jingyun Liang, Jiezhang Cao, Yulun Zhang, Hao Tang, Radu Timofte, and Luc Van Gool. "Practical Blind Denoising via Swin-Conv-UNet and Data Synthesis". In: *Machine Intelligence Research* (2023)

[3] Kai Zhang, **Yawei Li**, Wangmeng Zuo, Lei Zhang, Luc Van Gool, and Radu Timofte. "Plug-and-play image restoration with deep denoiser prior". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2021)

[4] **Yawei Li**, Xiaofeng Li, and Zhizhong Fu. "Modified non-local means for super-resolution of hybrid videos". In: *Computer Vision and Image Understanding* 168 (2018), pp. 64–78

[5] **Yawei Li**, Xiaofeng Li, Norman C Beaulieu, and Zhizhong Fu. "Envelope and phase statistics of Cauchy quadratures". In: *Electronics Letters* 52.13 (2016), pp. 1132–1134

[6] Zhizhong Fu, **Yawei Li**, Yuan Li, Lan Ding, and Keyu Long. "Frequency domain based super-resolution method for mixed-resolution multi-view images". In: *Journal of Systems Engineering and Electronics* 27.6 (2016), pp. 1303–1314

Patents

[1] **Yawei Li**, Bert Moons, Tijmen Pieter Frederik Blankevoort, Amirhossein Habibian, and Babak Ehteshami Bejnordi. *Processing video content using gated transformer neural networks*. US Patent No. 20230090941. Mar. 23, 2023

Preprints

[1] Bin Ren, **Yawei Li**, Jingyun Liang, Rakesh Ranjan, Mengyuan Liu, Rita Cucchiara, Luc Van Gool, and Nicu Sebe. "Key-Graph Transformer for Image Restoration". In: *arXiv preprint arXiv:2402.02634* (2024)

[2] Pietro Bonazzi, Sizhen Bian, Giovanni Lippolis, **Yawei Li**, Sadique Sheik, and Michele Magno. "A Low-Power Neuromorphic Approach for Efficient Eye-Tracking". In: *arXiv preprint arXiv:2312.00425* (2023)

[3] Julian Moosmann, Pietro Bonazzi, **Yawei Li**, Sizhen Bian, Philipp Mayer, Luca Benini, and Michele Magno. "Ultra-Efficient On-Device Object Detection on AI-Integrated Smart Glasses with TinyissimoYOLO". in: *arXiv preprint arXiv:2311.01057* (2023)

[4] Jiezhang Cao, **Yawei Li**, Kai Zhang, and Luc Van Gool. "Video Super-Resolution Transformer". In: *arXiv preprint arXiv:2106.06847* (2021)

Workshop and Challenge Reports

[1] **Yawei Li**, Yulun Zhang, Radu Timofte, Luc Van Gool, Lei Yu, Youwei Li, Xinpeng Li, Ting Jiang, Qi Wu, Mingyan Han, et al. "NTIRE 2023 challenge on efficient super-resolution: Methods and results". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*. 2023, pp. 1921–1959

[2] **Yawei Li**, Yulun Zhang, Radu Timofte, Luc Van Gool, Zhijun Tu, Kunpeng Du, Hailing Wang, Hanting Chen, Wei Li, Xiaofei Wang, et al. "NTIRE 2023 challenge on image denoising: Methods and results". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*. 2023, pp. 1904–1920

[3] Yulun Zhang, Kai Zhang, Zheng Chen, **Yawei Li**, Radu Timofte, Junpei Zhang, Kexin Zhang, Rui Peng, Yanbiao Ma, Licheng Jia, et al. "NTIRE 2023 challenge on image super-resolution (x4): Methods and results". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*. 2023, pp. 1864–1883

[4] **Yawei Li**, Kai Zhang, Radu Timofte, et al. "NTIRE 2022 Challenge on Efficient Super-Resolution: Methods and Results". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*. June 2022, pp. 1062–1102

[5] Kai Zhang, Martin Danelljan, **Yawei Li**, and Radu Timofte. "AIM 2020 Challenge on Efficient Super-Resolution: Methods and Results". In: *Proceedings of the European Conference on Computer Vision Workshops*. 2020

[5] Andrey Ignatov et al. "PIRM Challenge on Perceptual Image Enhancement on Smartphones: Report". In: *Computer Vision – ECCV 2018 Workshops*. Ed. by Laura Leal-Taixé and Stefan Roth. Cham: Springer International Publishing, 2019, pp. 315–333

Academic Service

Workshop and Challenge Organization

- NTIRE 2024: New Trends in Image Restoration and Enhancement Workshop in conjunction with CVPR 2024
- NTIRE 2023: New Trends in Image Restoration and Enhancement Workshop in conjunction with CVPR 2023
- NTIRE 2022: New Trends in Image Restoration and Enhancement Workshop in conjunction with CVPR 2022
- AIM 2020: Advances in Image Manipulation Workshop in conjunction with ECCV 2020

Senior Program Committe (SPC) Member

- The AAAI Conference on Artificial Intelligence (AAAI), 2023-2024
- International Joint Conference on Artificial Intelligence (IJCAI), 2021

Outstanding Reviewer

- Asian Conference on Computer Vision (ACCV), 2020

Conference Reviewer

- The IEEC/CVF Conference on Computer Vision and Pattern Recognition (CVPR)
- The IEEE/CVF International Conference on Computer Vision (ICCV)
- The European Conference on Computer Vision (ECCV)
- The International Conference on Learning Representations (ICLR)
- The Annual Conference on Neural Information Processing Systems (NeurIPS)
- The International Conference on Machine Learning (ICML)
- The AAAI Conference on Artificial Intelligence (AAAI)
- The ACM International Conference on Multimedia (ACM Multimedia)
- The International Joint Conference on Artificial Intelligence (IJCAI)
- The Asian Conference on Computer Vision (ACCV)
- The IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)
- Pacific Graphics

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- International Journal of Computer Vision

- IEEE Transactions on Image Processing
- Knowledge-Based Systems
- International Journal of Intelligent Systems
- Acta Automatica Sinica (自动化学报)
- Neural Networks
- Neurocomputing
- Journal of Signal Processing Systems
- Journal of Systems Architecture
- PLOS ONE

Project Manager

- New Efficient CV-NN Architecture for Image-to-Image Translation in Camera-Video Pipeline

Student Supervision

03/24-now Morin Lucas, PhD student
03/24-now Alexandru Dimofte, Master student
03/24-now Glenn Anta Bucagu, Master student
01/24-now Yutong Xiang, Master student
10/23-now Maurits Reitsma, Master student
09/23-12/23 Sebastian Jäger, Master student
08/23-now Bin Ren, visiting PhD student, with Luc Van Gool, Nicu Sebe, and Rita Cucchiara
04/23-now Pietro Bonazzi, Research assistant, with Michele Magno
04/23-now Leheng Zhang, PhD student, with Shuhang Gu
03/21-06/23 Jiezhang Cao, PhD student, with Luc Van Gool
07/22-03/23 Xujie Shen, Master student
07/21-07/23 Xinchen Gao, Master student
02/20-11/21 Yuxuan Wei, Master student
11/20-10/21 Huseyin Ziya Imamoglu, Master student
10/19-03/20 Silvio Paganucci, Master student
10/20-12/20 Tobias Hächler, Bachelor student
10/20-12/20 Jules Authier, Bachelor student

Languages

- Chinese: Native; English: Fluent

Computer Skills

- Programming: Python, PyTorch, Tensorflow, Matlab
- Typesetting: LaTeX

Referee

- **Luc Van Gool** *Email: vangool@vision.ee.ethz.ch*, Full Professor, Computer Vision Lab, ETH Zürich, Switzerland, KU Leuven, Belgium, and INSAIT, Bulgaria
- **Radu Timofte** *Email: radu.timofte@uni-wuerzburg.de*, Humboldt Professor for AI and Computer Vision, Computer Vision Lab, University of Würzburg, Germany

- **Michele Magno** *Email: michele.magno@pbl.ee.ethz.ch*, Senior Scientist, Center for Project-Based Learning, ETH Zürich, Switzerland
- **Luca Benini** *Email: lbenini@iis.ee.ethz.ch*, Full professor, Integrated Systems Lab, ETH Zürich, Switzerland and University of Bologna, Italy