Jiaying Lin

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Summary

My research focuses on exploring **new, practical, and essential** problems in deep learning, computer vision, and computer graphics. During my Ph.D. studies, I am working on building robust and/or multimodal vision applications such as:

- Detecting inconspicuous objects (e.g., mirrors, glass, and camouflaged objects) from real-world RGB and RGB-D data
- 3D vision with imperfect or multimodal data (e.g., segmentation with noisy labels and question answering from point clouds)

Education

City University of Hong Kong (CityU), Hong Kong SAR — Sept. 2019 – May 2023
Ph.D. in Computer Science (Early graduation, supervisor: Rynson W.H. Lau)

South China University of Technology, Guangzhou, China — Sept. 2015 – Jul. 2019
B.Eng. in Computer Science and Technology (Elite Program, **top 0.4%**)

Working Experience

Postdoctoral Researcher (Research Talent Hub), City University of Hong Kong — Jun. 2023 – Present
Research Assistant, The Chinese University of Hong Kong — Feb. 2019 – May 2019
Research Assistant, The University of Hong Kong — Jul. 2018 – Nov. 2018

Research Experience

Inconspicuous object detection — CityU, Aug 2019 – Present

Supervisor: Rynson W.H. Lau

- Propose the **first** in-the-wild mirror detection benchmark (**CVPR 2020**)
- Propose the **first** in-the-wild glass surface detection benchmark (**CVPR 2021**)
- Propose the **first** in-the-wild glass benchmark with fine-grained semantic annotations (**NeurIPS 2022**)
- Propose the **first** video mirror detection benchmark (**CVPR 2023**)
- Publish papers as **first**/second/corresponding author in **CVPR 2020**, **CVPR 2021**, **CVPR 2022**, **TOMM 2022**, **TPAMI 2022**, **NeurIPS 2022**, **AAAI 2023**, **CVPR 2023**, **ICCV 2023**

3D vision with imperfect or multi-modal data — CityU, Aug 2020 – Present

Collaborate with Shuquan Ye by providing the initial ideas for these projects:

- Robust point cloud segmentation with noisy labels (**ICCV 2021 (oral, 3.4% acceptance rate), TPAMI 2022**)
  - Help construct the **first** evaluation benchmark for this problem by building the annotation tool for clean labels.
- Multimodal question answering with integrating information across text and 3D point cloud. (**TVCG 2022**)
  - Help construct the **first** crowdsourced benchmark for this problem by building the annotation collection web server.

Optimization on racetrack memory systems — CUHK, Feb 2019 – May 2019

Research assistant in CUHK Cyber-Physical Memory System Group, the Chinese University of Hong Kong

- Explore optimized designs for racetrack memory systems

Secure large-scale machine learning system — HKU, Jul 2018 – Nov 2018

Research assistant at HKU Systems Software Group, the University of Hong Kong

- Help develop a secure large-scale machine learning framework based on Intel SGX

Publications

Summary: Publish 11 papers as first/second/corresponding author in TPAMI (1), ACM Trans. (1), CCF-A (11).

*: equal contribution, **✉:** corresponding author, **◇:** junior undergraduate student I mentored

[1] Multi-view Dynamic Reflection Prior for Video Glass Surface Detection
Fang Liu*◇, Yuhao Liu*◇, **Jiaying Lin**✉, Ke Xu, Rynson W.H. Lau.
the Thirty-Eighth AAAI Conference on Artificial Intelligence (**AAAI**, CCF-A), 2024.

[2] Self-supervised Pre-training for Mirror Detection
Jiaying Lin✉, Rynson W.H. Lau.
IEEE/CVF International Conference on Computer Vision (**ICCV**, CCF-A), 2023.

[3] Learning to Detect Mirrors from Videos via Dual Correspondences
Jiaying Lin*, Xin Tan*, Rynson W.H. Lau.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, CCF-A), 2023.

[4] Weakly-Supervised Camouflaged Object Detection with Scribble Annotations
Ruozhen He*◇, Qihua Dong*◇, **Jiaying Lin**✉, Rynson W.H. Lau.
Thirty-Seventh AAAI Conference on Artificial Intelligence (**AAAI**, CCF-A), **Oral (10.9%)**, 2023.

[5] Efficient Mirror Detection via Multi-level Heterogeneous Learning
Ruozhen He◇, **Jiaying Lin**✉, Rynson W.H. Lau.
Thirty-Seventh AAAI Conference on Artificial Intelligence (**AAAI**, CCF-A), **Oral (10.9%)**, 2023.

[6] Symmetry-Aware Transformer-based Mirror Detection
Tianyu Huang◇, Bowen Dong, **Jiaying Lin**, Xiaohui Liu, Rynson W.H. Lau, Wangmeng Zuo
Thirty-Seventh AAAI Conference on Artificial Intelligence (**AAAI**, CCF-A), 2023.

[7] Exploiting Semantic Relations for Glass Surface Detection
Jiaying Lin*,Yuen-Hei Yeung*◇, Rynson W.H. Lau.
Thirty-Sixth Conference on Neural Information Processing Systems (**NeurIPS**, CCF-A), **Spotlight (5.16%)**, 2022.

[8] Frequency-aware Camouflaged Object Detection
Jiaying Lin*, Xin Tan*, Ke Xu, Lizhuang Ma, Rynson W.H. Lau.
ACM Transactions on Multimedia Computing Communications and Applications (**TOMM**), 2022.

[9] Mirror Detection with the Visual Chirality Cue
Xin Tan, **Jiaying Lin**, Ke Xu, Pan Chen, Lizhuang Ma, Rynson W.H. Lau.
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**, CCF-A), 2022.

[10] Learning Semantic Associations for Mirror Detection
Huankang Guan, **Jiaying Lin**, Rynson W.H. Lau.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, CCF-A), 2022.

[11] Rich Context Aggregation with Reflection Prior for Glass Surface Detection
Jiaying Lin, Zebang He, Rynson W.H. Lau.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, CCF-A), 2021.

[12] Progressive Mirror Detection
Jiaying Lin, Guodong Wang, Rynson W.H. Lau.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, CCF-A), 2020.

[13] Coherence and Identity Learning for Arbitrary-length Face Video Generation

Shuquan Ye, Chu Han, **Jiaying Lin**, Guoqiang Han, Shengfeng He.

International Conference on Pattern Recognition (**ICPR**), 2020.

[14] An Estimation of Distribution Algorithm for Large-Scale Optimization with Cooperative Co-evolution and Local Search

Jiaying Lin, Wei-Neng Chen, Jun Zhang.

International Conference on Information Science and Technology (**ICONIP**), 2018.

Manuscripts / Preprints

[1] Reflection-aware Glass Surface Detection with Rich Context

Jiaying Lin, Zebang He, Yuen-Hei Yeung, Rynson W.H. Lau.

IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), in submission.

[2] Depth-aware Glass Surface Detection with Cross-modal Context Mining

Jiaying Lin*, Yuen-Hei Yeung*, Rynson W.H. Lau.

IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), in submission. *arXiv:2206.11250*

[3] Rethinking Video Salient Object Ranking

Jiaying Lin, Huankang Guan, Rynson W.H. Lau.

International Journal of Computer Vision (**IJCV**), in submission. *arXiv:2203.17257*

Patents

[1] Ship name identification method, system, computer equipment and storage medium. CN111582182B, issued.

Professional Activities

Journal Review

- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Image Processing (TIP), IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)

Conference Review / Program Committee

- CVPR 2022, ECCV 2022, AAAI 2023, CVPR 2023, ICCV 2023, NeurIPS 2023, AAAI 2024, WACV 2024

Teaching

- Introduction to Computer Studies (CS1102), Semester A 2019/20
- Virtual Reality (CS4188/CS5188), Semester B 2019/20, Semester B 2020/21, Semester B 2021/22, Semester B 2022/23
- Multimedia Technologies and Applications (CS4185/CS5185), Semester A 2021/22, Semester A 2022/23
- Machine Learning (CS4487), Semester A 2020/21

Honors & Awards

- CVPR Travel and Registration Support, CVPR 2023 — 2023
- AAAI Student Scholarship, AAAI 2023 — 2023
- Outstanding Reviewer, ECCV 2022 — 2022
- Research Tuition Scholarship, City University of Hong Kong **(Top 6%, 21/344)** — 2022 - 2023
- Postgraduate Studentship, City University of Hong Kong — 2019 - 2023
- Undergraduate Studentship, South China University of Technology — 2016, 2017, 2018
- Elite Student Program, South China University of Technology **(Top 0.4%)** — 2015 - 2019

Skills

Programming: Python, C++, MATLAB, JavaScript

Language: English, Cantonese, Mandarin

Deep Learning: Pytorch, Tensorflow, Caffe

OS: Linux, Windows, macOS