

## Introduction

My primary research interests lie in building human-aligned, efficient, and robust multimodal and computer vision applications. I aim to bridge the theory and practice of computer vision and computer graphics, particularly in areas such as autonomous driving, medical imaging, and embodied AI, where human alignment, efficiency and robustness are critical.

In my recent work, I have led projects that include:

- Human-aligned Perception and Generation
- Inconspicuous Object Segmentation
- 3D Perception and Generation
- Medical Image Analysis and Synthesis

## Education

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|----------------------------------------------------------------|------------------------|
| <b>City University of Hong Kong (CityUHK)</b> , Hong Kong      | Sept. 2019 – May 2023  |
| Ph.D. in Computer Science (Early graduation)                   |                        |
| <b>South China University of Technology</b> , Guangzhou, China | Sept. 2015 – Jul. 2019 |
| B.Eng. in Computer Science and Technology (Elite Program)      |                        |

## Working Experience

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|------------------------------------------------------------------------|------------------------|
| <b>Researcher</b> , The Hong Kong University of Science and Technology | Mar. 2025 – Present    |
| <b>Research Fellow</b> , City University of Hong Kong                  | Sept. 2024 – Feb. 2025 |
| <b>Postdoctoral Researcher</b> , City University of Hong Kong          | Jun. 2023 – Aug. 2024  |
| <b>Research Assistant</b> , The Chinese University of Hong Kong        | Feb. 2019 – May. 2019  |
| <b>Research Assistant</b> , The University of Hong Kong                | Jul. 2018 – Nov. 2018  |

## Research Experience

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| <b>Human-aligned Multimodal LLM</b>                                                                                                                                                                                                                                                                                                                          | Project lead @ CityUHK, Feb. 2024 - Nov. 2025               |
| <ul style="list-style-type: none"> <li>- Construct the first benchmark to evaluate how MLLMs follow the human vision system.</li> <li>- Reveal new challenges for cutting-edge MLLMs, offer HVS-alignment insights, and propose methods to enhance them.</li> </ul>                                                                                          |                                                             |
| <b>Animating 3D Gaussian Splatting Scenes</b>                                                                                                                                                                                                                                                                                                                | Project lead @ CityUHK, Nov. 2023 - Feb. 2025               |
| <ul style="list-style-type: none"> <li>- Propose the first method to generate general text-conditioned 4D animation for arbitrary static 3DGS scenes.</li> <li>- The method leverages single-view motion knowledge from video diffusion models and ensures multi-view consistency.</li> </ul>                                                                |                                                             |
| <b>Controllable Fundus Image Sequence Generation</b>                                                                                                                                                                                                                                                                                                         | CityUHK & SJTU, Feb. 2024 – Feb. 2025                       |
| <ul style="list-style-type: none"> <li>- Propose the first controllable method for fundus image sequence generation conditioned on time and lesion type</li> <li>- Propose the first fundus image sequence benchmark with lesion types and follow-up time points, over a five-year period</li> </ul>                                                         |                                                             |
| <b>Open-vocabulary 3D Perception</b>                                                                                                                                                                                                                                                                                                                         | Project lead @ CityUHK, Aug. 2023 – Present                 |
| <ul style="list-style-type: none"> <li>- Propose a hierarchical cross-modal alignment method for open-vocabulary 3D object detection</li> <li>- Propose the first benchmark and method for generalized open-vocabulary 3D understanding</li> <li>- Supervise junior Ph.D. students and publish papers as leading authors in top-tier conferences</li> </ul>  |                                                             |
| <b>Inconspicuous object segmentation</b>                                                                                                                                                                                                                                                                                                                     | Project lead (Ph.D. thesis) @ CityUHK, Aug 2019 – Feb. 2025 |
| <ul style="list-style-type: none"> <li>- Propose the first in-the-wild inconspicuous object benchmark and methods based on images, videos, and multimodal data</li> <li>- Propose label-efficient (e.g., scribble-based) and time-efficient methods for this task.</li> <li>- Supervise junior Ph.D. and undergraduate students to publish papers</li> </ul> |                                                             |
| <b>Secure large-scale machine learning systems</b>                                                                                                                                                                                                                                                                                                           | Research Assistant @ HKU, Jul 2018 – Nov 2018               |
| <ul style="list-style-type: none"> <li>- Help develop a secure large-scale machine learning framework based on Intel SGX</li> </ul>                                                                                                                                                                                                                          |                                                             |

## Publications

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

- [1] Do MLLMs Exhibit Human-like Perceptual Behaviors?  
HVS-Bench: A Benchmark for MLLM Alignment with Human Perceptual Behavior  
**Jiaying Lin\***, Shuquan Ye\*, Dan Xu, Wanli Ouyang, Rynson W.H. Lau.  
*IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, CCF-A)*, Findings, 2026.
- [2] OpenScan: A Benchmark for Generalized Open-Vocabulary 3D Scene Understanding  
Youjun Zhao, **Jiaying Lin✉**, Shuquan Ye, Qianshi Pang, Rynson W.H. Lau.  
*Fortieth AAAI Conference on Artificial Intelligence (AAAI, CCF-A)*, 2026.
- [3] A Contrastive-Learning Framework for Unsupervised Salient Object Detection  
Huankang Guan, **Jiaying Lin**, Rynson W.H. Lau.  
*IEEE Transactions on Image Processing (TIP, CCF-A, JCR-Q1)*, 2025.
- [4] Hierarchical Cross-Modal Alignment for Open-Vocabulary 3D Object Detection  
Youjun Zhao\*, **Jiaying Lin\***, Rynson W.H. Lau.  
*Thirty-Ninth AAAI Conference on Artificial Intelligence (AAAI, CCF-A)*, 2025.
- [5] Leveraging RGB-D Data with Cross-Modal Context Mining for Glass Surface Detection  
**Jiaying Lin\***, Yuen-Hei Yeung\*◇, Shuquan Ye, Rynson W.H. Lau.  
*Thirty-Ninth AAAI Conference on Artificial Intelligence (AAAI, CCF-A)*, 2025.
- [6] Boosting Weakly-Supervised Referring Image Segmentation via Progressive Comprehension  
Zaiquan Yang, Yuhao Liu, **Jiaying Lin**, Gerhard Hancke, Rynson W.H. Lau.  
*Thirty-Eighth Conference on Neural Information Processing Systems (NeurIPS, CCF-A)*, 2024.
- [7] Effective Video Mirror Detection with Inconsistent Motion Cues  
Alex Warren, Ke Xu, **Jiaying Lin**, Gary Tam, Rynson W.H. Lau.  
*IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, CCF-A)*, 2024.
- [8] Multi-view Dynamic Reflection Prior for Video Glass Surface Detection  
Fang Liu\*, Yuhao Liu\*, **Jiaying Lin✉**, Ke Xu, Rynson W.H. Lau.  
*Thirty-Eighth AAAI Conference on Artificial Intelligence (AAAI, CCF-A)*, 2024.
- [9] Self-supervised Pre-training for Mirror Detection  
**Jiaying Lin✉**, Rynson W.H. Lau.  
*IEEE/CVF International Conference on Computer Vision (ICCV, CCF-A)*, 2023.
- [10] 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.
- [11] 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.
- [12] 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.

- [13] Symmetry-Aware Transformer-based Mirror Detection  
Tianyu Huang $\diamond$ , Bowen Dong, **Jiaying Lin**, Xiaohui Liu, Rynson W.H. Lau, Wangmeng Zuo  
*Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI, CCF-A)*, 2023.
- [14] Exploiting Semantic Relations for Glass Surface Detection  
**Jiaying Lin**<sup>\*</sup>, Yuen-Hei Yeung <sup>$\diamond$</sup> , Rynson W.H. Lau.  
*Thirty-Sixth Conference on Neural Information Processing Systems (NeurIPS, CCF-A)*, **Spotlight (5.16%)**, 2022.
- [15] Frequency-aware Camouflaged Object Detection  
**Jiaying Lin**<sup>\*</sup>, Xin Tan<sup>\*</sup>, Ke Xu, Lizhuang Ma, Rynson W.H. Lau.  
*ACM Transactions on Multimedia Computing Communications and Applications (TOMM, JCR-Q1)*, 2022.
- [16] 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.
- [17] 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.
- [18] 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.
- [19] Progressive Mirror Detection  
**Jiaying Lin**, Guodong Wang, Rynson W.H. Lau.  
*IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, CCF-A)*, 2020.
- [20] 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.
- [21] 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

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- [1] UniFunc3D: Unified Active Spatial-Temporal Grounding for 3D Functionality Segmentation  
Jiaying Lin, Dan Xu  
[arXiv:2603.23478](https://arxiv.org/abs/2603.23478)
- [2] From Static Spectra to Operando Infrared Dynamics: Physics Informed Flow Modeling and a Benchmark  
Shuquan Ye, Ben Fei, Hongbin Xu, **Jiaying Lin**, Wanli Ouyang.  
[arXiv:2602.18551](https://arxiv.org/abs/2602.18551)
- [3] Rethinking Video Salient Object Ranking  
**Jiaying Lin**, Huankang Guan, Rynson W.H. Lau.  
[arXiv:2203.17257](https://arxiv.org/abs/2203.17257)

## Patents

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

## Professional Activities

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### Journal Review

- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Image Processing (TIP)
- IEEE Transactions on Multimedia (TMM)
- 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, CVPR 2024, ECCV 2024, SIGGRAPH 2024, SIGGRAPH Asia 2024, CVPR 2025, AAAI 2025, ICCV 2025, ACM MM 2025, AAAI 2026, CVPR 2026

### Teaching

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During my Ph.D. studies at CityUHK, I served as both a co-instructor (Lecturer) and Teaching Assistant for eight courses:

- 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

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- CVPR Travel 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% in the Uni.**) 2015 - 2019

### Skills

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**Programming:** Python, C++, CUDA, MATLAB

**Language:** Cantonese (native), English (fluent), Mandarin (native)

**Deep Learning:** Pytorch, Tensorflow, Caffe

**OS:** Linux, Windows, macOS