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CONTACT INFORMATION

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City University of Hong Kong

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Researcher Profile:    

EDUCATION

City University of Hong Kong, Hong Kong, China

Ph.D., Department of Computer Science, 2025 to Present
• Supervisor: Prof. Yuguang “Michael” Fang

Singapore Management University, Singapore

Visiting Ph.D., School of Computing and Information Systems, 2023 to 2024
• Supervisor: Prof. Shengfeng He

Wuhan University of Technology, Wuhan, China

Ph.D., School of Navigation, 2021 to 2026
B.Eng., School of Transportation, 2017 to 2021

EMPLOYMENT AND EXPERIENCE

City University of Hong Kong, Hong Kong, China

Research Assistant, School of Computer Science, 2024 to 2025
• Supervisor: Prof. Yuguang “Michael” Fang
Remote Intern, School of Computer Science, 2024 to 2024
• Supervisor: Prof. Yuguang “Michael” Fang

TEACHING EXPERIENCE

City University of Hong Kong, Hong Kong, China

Teaching Assistant, Department of Computer Science, 2025 Fall to Present
• CS1302 Introduction to Computer course (2025 Fall, 2026 Spring)

RESEARCH INTERESTS

Computer Vision, Image Generation, World Model.

PUBLICATIONS

Summary

Transactions: 12; NeurIPS: 1; ICML: 2; ECCV: 2

* co-first authorship; † corresponding author

Journal Papers

- [J.1] Yuxuan Tian, **Yu Guo**[†], Yuxu Lu, Yuan Gao, and Ryan Wen Liu. Towards a Physical Imaging-driven Sparse Attention Dehazer for Internet of Things-aided Maritime Intelligent Transportation, *Computers and Electrical Engineering (CAEE)*, 2025.
- [J.2] Jingxiang Qu, Ryan Wen Liu[†], Yuan Gao, **Yu Guo**, Fenghua Zhu, and Fei-Yue Wang. Double Domain Guided Real-time Low-light Image Enhancement for Ultra-high-definition Transportation Surveillance, *IEEE Transactions on Intelligent Transportation Systems (TITS)*, 2024.
- [J.3] Ryan Wen Liu, **Yu Guo**[†], Yuxu Lu, Xi-Le Zhao, and An-An Liu. S3Net: Semi-self-supervised Neural Network for Visibility Enhancement of Speckled Images, *Computers and Electrical Engineering (CAEE)*, 2024.
- [J.4] Yuxu Lu, Dong Yang[†], Yuan Gao, Ryan Wen Liu, Jun Liu, and **Yu Guo**. AoSRNet: All-in-One Scene Recovery Networks via Multi-knowledge Integration, *Knowledge-Based Systems (KBS)*, 2024.

- [J.5] Ryan Wen Liu, Yuxu Lu[†], Yuan Gao, **Yu Guo**, Wenqi Ren, Fenghua Zhu[†], and Fei-Yue Wang. [Real-time Multi-scene Visibility Enhancement for Promoting Navigational Safety of Vessels Under Complex Weather Conditions](#), *IEEE Transactions on Intelligent Transportation Systems (TITS)*, 2024.
- [J.6] Wenyu Xu, Dong Yang[†], Yuan Gao, Yuxu Lu[†], Jingming Zhang, and **Yu Guo**. [MvKSR: Multi-view Knowledge-guided Scene Recovery for Hazy and Rainy Degradation](#), *IEEE Transactions on Instrumentation and Measurement (TIM)*, 2024.
- [J.7] **Yu Guo**, Ryan Wen Liu[†], Yuxu Lu, Jiangtian Nie, Lingjuan Lyu, Zehui Xiong, Jiawen Kang, Han Yu, and Dusit Niyato. [Haze Visibility Enhancement for Promoting Traffic Situational Awareness in Vision-enabled Intelligent Transportation](#), *IEEE Transactions on Vehicular Technology (TVT)*, 2023.
- [J.8] **Yu Guo**, Ryan Wen Liu[†], Jingxiang Qu, Yuxu Lu, Fenghua Zhu[†], and Yisheng Lv. [Asynchronous Trajectory Matching-based Multimodal Maritime Data Fusion for Vessel Traffic Surveillance in Inland Waterways](#), *IEEE Transactions on Intelligent Transportation Systems (TITS)*, 2023.
- [J.9] Jingxiang Qu, Ryan Wen Liu[†], **Yu Guo**, Yuxu Lu, Jianlong Su, and Peizheng Li. [Improving Maritime Traffic Surveillance in Inland Waterways using the Robust Fusion of AIS and Visual Data](#), *Ocean Engineering (OE)*, 2023.
- [J.10] **Yu Guo**, Yuxu Lu, Ryan Wen Liu[†], and Fenghua Zhu. [Blind Image Despeckling Using Multi-scale Attention-guided Neural Network](#), *IEEE Transactions on Artificial Intelligence (TAI)*, 2023.
- [J.11] Jingxiang Qu, Ryan Wen Liu[†], Chenjie Zhao, **Yu Guo**, Sendren Sheng-Dong Xu, Fenghua Zhu[†], and Yisheng Lv. [Multi-task Learning-enabled Automatic Vessel Draft Reading for Intelligent Maritime Surveillance](#), *IEEE Transactions on Intelligent Transportation Systems (TITS)*, 2023.
- [J.12] Ryan Wen Liu, Yuxu Lu[†], **Yu Guo**, Wenqi Ren, Fenghua Zhu[†], and Yisheng Lv. [AiOENet: All-in-one Low-visibility Enhancement to Improve Visual Perception for Intelligent Marine Vehicles Under Severe Weather Conditions](#), *IEEE Transactions on Intelligent Vehicles (TIV)*, 2023.
- [J.13] Yuxu Lu^{*}, **Yu Guo**^{*}, Ryan Wen Liu[†], and Wenqi Ren. [MTRBNet: Multi-branch Topology Residual Block-based Network for Low-light Enhancement](#), *IEEE Signal Processing Letters (SPL)*, 2022.
- [J.14] Ryan Wen Liu, **Yu Guo**, Yuxu Lu, Kwok Tai Chui[†], and Brij B Gupta[†]. [Deep Network-enabled Haze Visibility Enhancement for Visual IoT-driven Intelligent Transportation Systems](#), *IEEE Transactions on Industrial Informatics (TII)*, 2022.
- [J.15] Ryan Wen Liu, **Yu Guo**, Jiangtian Nie[†], Qin Hu, Zehui Xiong, Han Yu, and Mohsen Guizani. [Intelligent Edge-enabled Efficient Multi-source Data Fusion for Autonomous Surface Vehicles in Maritime Internet of Things](#), *IEEE Transactions on Green Communications and Networking (TGCN)*, 2022.
- [J.16] **Yu Guo**^{*}, Yuxu Lu^{*}, and Ryan Wen Liu[†]. [Lightweight Deep Network-enabled Real-time Low-visibility Enhancement for Promoting Vessel Detection in Maritime Video Surveillance](#), *The Journal of Navigation (JON)*, 2022.
- [J.17] Yuxu Lu^{*}, **Yu Guo**^{*}, Ryan Wen Liu[†], Kwok Tai Chui[†], and Brij B Gupta. [GradDT: Gradient-guided Despeckling Transformer for Industrial Imaging Sensors](#), *IEEE Transactions on Industrial Informatics (TII)*, 2022.
- [J.18] Ryan Wen Liu, Nian Liu, Yanhong Huang[†], and **Yu Guo**[†]. [Attention-guided Lightweight Generative Adversarial Network for Low-light Image Enhancement in Maritime Video Surveillance](#), *The Journal of Navigation (JON)*, 2022.
- [J.19] **Yu Guo**^{*}, Yuxu Lu^{*}, Jingxiang Qu, Ryan Wen Liu[†], and Wenqi Ren. [MDSFE: Multi-scale Deep Stacking Fusion Enhancer Network for Visual Data Enhancement](#), *IEEE Transactions on Instrumentation and Measurement (TIM)*, 2022.
- [J.20] Yuxu Lu, **Yu Guo**, and Maohan Liang[†]. [CNN-enabled Visibility Enhancement Frame-](#)

- work for Vessel Detection under Haze Environment, *Journal of Advanced Transportation (JAT)*, 2021.
- [J.21] Yongqi Guo, Yuxu Lu, **Yu Guo**, Ryan Wen Liu[†], and Kwok Tai Chui[†]. Intelligent Vision-enabled Detection of Water-surface Targets for Video Surveillance in Maritime Transportation, *Journal of Advanced Transportation (JAT)*, 2021.
- [J.22] **Yu Guo**^{*}, Yuxu Lu^{*}, Ryan Wen Liu[†], Meifang Yang, and Kwok Tai Chui[†]. Low-light Image Enhancement with Regularized Illumination Optimization and Deep Noise Suppression, *IEEE Access (Access)*, 2020.

Conference Papers

- [C.1] Senkang Hu, Yong Dai, Yuzhi Zhao, Yihang Tao, **Yu Guo**, Zhengru Fang, Sam Tak Wu Kwong, and Yuguang Fang. Optimizing Agentic Reasoning with Retrieval via Synthetic Semantic Information Gain Reward, *International Conference on Machine Learning (ICML)*, 2026.
- [C.2] Zhengru Fang, Zhenghao Liu, Jingjing Wang, Senkang Hu, **Yu Guo**, Yiqin Deng, and Yuguang Fang. Task-oriented Communications for Visual Navigation with Edge-aerial Collaboration in Low Altitude Economy, *IEEE Global Communications Conference (GlobeCom)*, 2025.
- [C.3] **Yu Guo**, Shengfeng He[†], Yuxu Lu, Haonan An, Yihang Tao, Huilin Zhu, Jingxian Liu, and Yuguang Fang. Neptune-X: Active X-to-Maritime Generation for Universal Maritime Object Detection, *Conference on Neural Information Processing Systems (NeurIPS)*, 2025. (Spotlight Presentation, Acceptance Rate: 3.2%)
- [C.4] Junhang Li^{*}, **Yu Guo**^{*}, Chuhua Xian[†], and Shengfeng He[†]. Instruct2See: Learning to Remove Any Obstructions Across Distributions, *International Conference on Machine Learning (ICML)*, 2025.
- [C.5] Huilin Zhu^{*}, Jingling Yuan^{*}, Zhengwei Yang^{*}, **Yu Guo**, Zheng Wang, Xian Zhong[†], and Shengfeng He[†]. Zero-shot Object Counting with Good Exemplars, *European Conference on Computer Vision (ECCV)*, 2024.
- [C.6] **Yu Guo**^{*}, Yuan Gao^{*}, Yuxu Lu, Huilin Zhu, Ryan Wen Liu[†], and Shengfeng He[†]. OneRestore: A Universal Restoration Framework for Composite Degradation, *European Conference on Computer Vision (ECCV)*, 2024.
- [C.7] **Yu Guo**, Yuan Gao, Ryan Wen Liu[†], Yuxu Lu, Jingxiang Qu, Shengfeng He, and Wenqi Ren. SCANet: Self-paced Semi-curricular Attention Network for Non-homogeneous Image Dehazing, *Computer Vision and Pattern Recognition Workshop @ NTIRE (CVPRW)*, 2023.
- [C.8] Codruta O Ancuti[†], Cosmin Ancuti, Florin-Alexandru Vasluiianu, Radu Timofte, Han Zhou, Wei Dong, Yangyi Liu, Jun Chen, Huan Liu, Liangyan Li, et al.. NTIRE 2023 HR Nonhomogeneous Dehazing Challenge Report, *Computer Vision and Pattern Recognition Workshop @ NTIRE (CVPRW)*, 2023.
- [C.9] **Yu Guo**, Ryan Wen Liu, Jiangtian Nie, Lingjuan Lyu, Zehui Xiong, Jiawen Kang, Han Yu, and Dusit Niyato. DADFNNet: Dual Attention and Dual Frequency-guided Dehazing Network for Video-empowered Intelligent Transportation, *AAAI Workshop on AI for Transportation (AAAIW)*, 2023. (Best Paper Award, Top 3)
- [C.10] Yuxu Lu, **Yu Guo**, Yanhong Huang, Fenghua Zhu, Xianjun Hu[†], and Ryan Wen Liu[†]. Fast Deep Multi-patch Progressive Network for Low-light Image Enhancement in Intelligent Transportation Systems, *International Conference on Intelligent Transportation Systems (ITSC)*, 2022.
- [C.11] Jingxiang Qu, **Yu Guo**, Yuxu Lu, Fenghua Zhu, Yingchun Huan[†], and Ryan Wen Liu[†]. Intelligent Maritime Surveillance Framework Driven by Fusion of Camera-based Vessel Detection and AIS Data, *International Conference on Intelligent Transportation Systems (ITSC)*, 2022.
- [C.12] Xijing Li, Yuxu Lu, **Yu Guo**, Jingxiang Qu, and Ryan Wen Liu[†]. Rep-Enhancer: Re-

- parameterizing Neural Network for Real-time Low-light Enhancement in Visual Maritime Surveillance, *IEEE International Conference on Embedded and Ubiquitous Computing (EUC)*, 2022.
- [C.13] **Yu Guo**, Yuxu Lu, Ryan Wen Liu, Lizheng Wang, and Fenghua Zhu. [Heterogeneous Twin Dehazing Network for Visibility Enhancement in Maritime Video Surveillance](#), *International Conference on Intelligent Transportation Systems (ITSC)*, 2021.
- [C.14] Yuxu Lu, **Yu Guo**, Fenghua Zhu, and Ryan Wen Liu. [Towards Low-visibility Enhancement in Maritime Video Surveillance: An Efficient and Effective Multi-deep Neural Network](#), *International Conference on Intelligent Transportation Systems (ITSC)*, 2021.
- [C.15] **Yu Guo**, Yuxu Lu, Meifang Yang, and Ryan Wen Liu[†]. [Low-light Image Enhancement with Deep Blind Denoising](#), *International Conference on Machine Learning and Computing (ICMLC)*, 2020.

Preprint Papers

- [P.1] Xudong Han^{*}, Senkang Hu^{*}, Yihang Tao, **Yu Guo**, Philip Birch, Sam Tak Wu Kwong, and Yuguang Fang. [DSP-Reg: Domain-sensitive Parameter Regularization for Robust Domain Generalization](#), *arXiv preprint arXiv:2601.19394*, 2026.
- [P.2] Yanan Ma, Zhengru Fang, Yihang Tao, **Yu Guo**, Yiqin Deng, Xianhao Chen, and Yuguang Fang. [Birdcast: Interest-aware BEV Multicasting for Infrastructure-assisted Collaborative Perception](#), *arXiv preprint arXiv:2604.00701*, 2026.
- [P.3] Zhengru Fang^{*}, **Yu Guo**^{*}, Fei Liu, Yuang Zhang, Yihang Tao, Senkang Hu, Wenbo Ding, and Yuguang Fang. [Agent-centric Visual Reinforcement Learning under Dynamic Perturbations](#), *arXiv preprint arXiv:2604.24661*, 2026.
- [P.4] Zhengru Fang, Yanan Ma, **Yu Guo**, Senkang Hu, Yixian Zhang, Hangcheng Cao, Wenbo Ding, and Yuguang Fang. [CXR-ContraBench: Benchmarking Negated-Option Attraction in Medical VLMs](#), *arXiv preprint arXiv:2605.05810*, 2026.
- [P.5] Zhengru Fang, Senkang Forest Hu, Zhonghao Chang, **Yu Guo**, Yihang Tao, Hongyao Liu, Mengzhe Ruan, Jun Huang, and Yuguang Fang. [Inference-Time Budget Control for LLM Search Agents](#), *arXiv preprint arXiv:2605.05701*, 2026.
- [P.6] Yihang Tao, **Yu Guo**, Zhengru Fang, Haonan An, and Yuguang Fang. [FRUC: Feedforward Dynamic Scene Reconstruction from Uncalibrated Collaborative Driving Views](#), *arXiv preprint arXiv:2605.29997*, 2026.
- [P.7] Yihang Tao^{*}, **Yu Guo**^{*}, Senkang Hu, Yanan Ma, Zihan Fang, Sam Kwong, and Yuguang Fang. [V2XCrafter: Learning to Generate Driving Scene Across Agents](#), *arXiv preprint arXiv:2605.29471*, 2026.
- [P.8] **Yu Guo**^{*}, Zhengru Fang^{*}, Shengfeng He, Senkang Hu, Yihang Tao, Phone Lin, and Yuguang Fang. [Universal Image Restoration via Internalized Chain-of-Thought Reasoning](#), *arXiv preprint arXiv:2606.17557*, 2026.
- [P.9] Huilin Zhu, Senyao Li, Jingling Yuan[†], Zhengwei Yang, **Yu Guo**, Wenxuan Liu, Xian Zhong[†], and Shengfeng He. [Expanding Zero-shot Object Counting with Rich Prompts](#), *arXiv preprint arXiv:2505.15398*, 2025.
- [P.10] Huilin Zhu, Jingling Yuan[†], Zhengwei Yang, **Yu Guo**, Xian Zhong[†], and Shengfeng He. [FocalCount: Towards Class-count Imbalance in Class-agnostic Counting](#), *arXiv preprint arXiv:2502.10677*, 2025.
- [P.11] Haonan An, Guang Hua, **Yu Guo**, Hangcheng Cao, Susanto Rahardja, and Yuguang Fang. [NWaaS: Nonintrusive Watermarking as a Service for X-to-Image DNN](#), *arXiv preprint arXiv:2507.18036*, 2025.
- [P.12] Zhengru Fang^{*}, **Yu Guo**^{*}, Yuang Zhang, Haonan An, Wenbo Ding, and Yuguang Fang. [Shared Spatial Memory Through Predictive Coding](#), *arXiv preprint arXiv:2511.04235*, 2025.

[P.13] Hao Wu^{*}, Yuan Gao^{*}, Ruijian Gou^{*}, Xian Wu^{*}, Chuhan Wu^{*}, Huahui Yi^{*}, Johannes Brandstetter, Fan Xu, Kun Wang, Penghao Zhao, Hao Jia, Qi Song, Xinliang Liu, Juncai He, Shuhao Cao, Huanshuo Dong, Yanfei Xiang, Fan Zhang, Haixin Wang, Xingjian Shi, Qiufeng Wang, Shuaipeng Li, Ruobing Xie, Feng Tao, Yuxu Lu, **Yu Guo**, Yuntian Chen, Yuxuan Liang, Qingsong Wen, Wanli Ouyang, Deliang Chen, Niklas Boers, and Xiaomeng Huang[†]. [Advanced Long-term Earth System Forecasting](#), *arXiv preprint arXiv:2505.19432*, 2025.

PATENTS

[Pt.1] Wen Liu, Jingxiang Qu, **Yu Guo**, Mengwei Bao, Chenjie Zhao, Jingxian Liu. [Tracking and Identification Method, Device, Electronic Device, and Storage Medium for Multiple Vessel Targets](#). US Patent 12008801, 2024.

[Pt.2] Wen Liu, Jingxiang Qu, Chenjie Zhao, Yang Zhang, **Yu Guo**. [Method and Device for Automatic Detection of Vessel Draft Depth](#). US Patent 11981403, 2024.

HONORS AND AWARDS

[H.1] **PhD Academic Scholarship**, CityU JC STEM Lab Fund, 2025.

[H.2] **PhD National Scholarship**, Wuhan University of Technology, 2023.

[H.3] **National Third Prize**, China Graduate Robot Innovation Design Competition, 2023.

[H.4] **National Second Prize**, China Intelligent Unmanned Boat Search and Rescue Competition, 2023.

[H.5] **First Prize**, Smart Shipping and Crew Quality Training Seminar Workshop, 2023.

[H.6] **Third Prize**, Smart Shipping and Crew Quality Training Seminar Workshop, 2023.

[H.7] **Provincial Science & Technology Progress Second Prize**, China Institute of Navigation, 2023.

[H.8] **Best Paper Award**, 2022 AAAI Conference on Artificial Intelligence Workshop: AI for Transportation, 2022.

[H.9] **PhD Excellence Scholarship**, Wuhan University of Technology, 2021.

[H.10] **Outstanding Undergraduate Thesis**, Wuhan University of Technology, 2021.

[H.11] **Outstanding Undergraduate Graduate**, Wuhan University of Technology, 2021.

[H.12] **Excellent Completion**, National Undergraduate Innovation and Entrepreneurship Training Program, 2021.

[H.13] **Hubei Provincial Silver Award**, China International College Students “Internet+” Innovation and Entrepreneurship Competition, 2020.

[H.14] **National Grand Prize**, China Ocean Vehicle Design and Production Competition, 2020.

[H.15] **National First Prize**, China Ocean Vehicle Design and Production Competition, 2020.

[H.16] **National Third Prize**, China Undergraduate Computer Design Competition, 2020.

ACADEMIC SERVICE

Conference Area Chair

- IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)
- European Conference on Computer Vision (ECCV)
- Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Learning Representations (ICLR)
- International Conference on Machine Learning (ICML)
- Pacific Graphics (PG)

Journal Editor-in-Chief Assistant

- IEEE Transactions on Machine Learning in Communications and Networking (TMLCN)

Journal Peer Reviewer

- IEEE Transactions on Image Processing (TIP)
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
- IEEE Transactions on Vehicular Technology (TVT)
- IEEE Transactions on Industrial Informatics (TII)
- IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI)
- Engineering Applications of Artificial Intelligence (EAAI)
- Pattern Recognition (PR)
- Neural Networks (NN)

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