

Guanchen Ding — Academic CV

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I am a Ph.D. candidate and Presidential Ph.D. Fellow in the Department of Computing at The Hong Kong Polytechnic University, supervised by **Prof. Changwen Chen**. My research focuses on visual semantic communication under rate and channel constraints, with particular interests in neural joint source-channel coding, generative semantic communication, task-oriented visual evidence, and reliable communication under distribution shift.

Research Interests

- **Semantic and Goal-Oriented Communication**
Neural Joint Source-Channel Coding, Generative Semantic Communication
- **Visual Representation and Machine Perception**
Structured Visual Evidence, Dense Scene Understanding, Object/Crowd Counting, Remote Sensing
- **Reliable and Generative Visual Computing**
Image/Video Compression, Generative Reconstruction, Domain Adaptation and Generalization

Education

- Ph.D. Student,
Department of Computing, **The Hong Kong Polytechnic University** 2023 – Present
(Advisor: Professor **Changwen Chen**)
- Master Degree,
School of Remote Sensing and Information Engineering, **Wuhan University** 2020 – 2023
(Advisor: Professor **Zhenzhong Chen**)
- Bachelor Degree,
School of Remote Sensing and Information Engineering, **Wuhan University** 2016 – 2020
(Advisor: Professor **Zhenzhong Chen**)
- Minor Degree,
School of Economics and Management, **Wuhan University** 2017 – 2020

Project Experience

- **Visual Semantic Communication** 2023–Present
Under the supervision of Prof. Changwen Chen, I study how bandwidth- and channel-constrained visual systems can communicate source-grounded information for human and machine receivers. Current work covers SNR- and bandwidth-adaptive neural JSCC, compact structured evidence for traffic-scene reasoning, and exact-rate progressive JSCC for dense scene understanding.
- **Visual Representation, Compression, and Generalization** 2022–Present
Research on bidirectional temporal alignment for learned video rescaling, neural rate control for JPEG-AI, and uncertainty-aware domain generalization for crowd and remote-sensing object counting. This work has led to publications in ICASSP, ACM Multimedia, IEEE TCSVT, IEEE TGRS, and IEEE TMM.
- **Earlier Computer Vision Projects** 2019–2021
Research on object counting, detection, tracking, and abnormal-event recognition for surveillance and V2X applications, with an emphasis on cross-domain robustness. The work led to publications in IEEE TGRS, IEEE TMM, VCIP, and CVPR Workshops, as well as placements in the Vision Meets Drones and AI City challenges.

Selected Publications

- Published and Accepted* *Listed in reverse chronological order.*
- Xiang Pan, **Guanchen Ding**, Zhenzhong Chen, and Chang Wen Chen, “An Efficient Neural Rate Control for JPEG-AI,” *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 36, no. 3, pp. 3917–3922, 2026.
 - Yanhuang Liu*, **Guanchen Ding***, Jiayi Wang, Daiqin Yang, Zhenzhong Chen, and Chang Wen Chen, “SCOUT-Count:

Stylization with Covariance-Whitening and Uncertainty for Domain-Generalized Remote Sensing Object Counting," *ISPRS Journal of Photogrammetry and Remote Sensing*, vol. 239, pp. 1063-1078, 2026. (*Equal contribution; **Guanchen Ding** is corresponding author.)

- Jiayi Wang, **Guanchen Ding**, Daiqin Yang, Zhenzhong Chen, and Chang Wen Chen, "Counting Beyond Domains: Toward Alignment in Unsupervised Domain Adaptation in Remote Sensing Object Counting," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 63, Art. no. 5648613, 2025.
- **Guanchen Ding**, Lingbo Liu, Zhenzhong Chen, and Chang Wen Chen, "Domain-Agnostic Crowd Counting via Uncertainty-Guided Style Diversity Augmentation," *Proceedings of the 32nd ACM International Conference on Multimedia*, 2024.
- **Guanchen Ding** and Chang Wen Chen, "Towards Omniscient Feature Alignment for Video Rescaling," *IEEE International Conference on Acoustics, Speech and Signal Processing*, 2024.
- Mingpeng Cui, **Guanchen Ding**, Daiqin Yang, and Zhenzhong Chen, "DOPNet: Dense Object Prediction Network for Multi-Class Object Counting and Localization in Remote Sensing Images," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 62, 2024.
- **Guanchen Ding**, Mingpeng Cui, Daiqin Yang, Tao Wang, Sihan Wang, and Yunfei Zhang, "Object Counting for Remote Sensing Images via Adaptive Density Map Assisted Learning," *IEEE Transactions on Geoscience and Remote Sensing*, 2022.
- **Guanchen Ding**, Daiqin Yang, Tao Wang, Sihan Wang, and Yunfei Zhang, "Crowd Counting via Unsupervised Cross-Domain Feature Adaptation," *IEEE Transactions on Multimedia*, 2022.

Selected Scholarships and Honors

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| ○ The Most Appreciated Teaching Assistant (MATA) award. | 2024 |
| ○ Presidential Ph.D. Fellowship, The Hong Kong Polytechnic University. | 2023–Present |
| ○ National scholarship for Postgraduates | 2022 |
| ○ The First-class scholarship of Wuhan University. | 2022, 2021, 2019, 2018 |

Selected Awards

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| ○ 2nd Place on Track3, 4th Vision Meets Drones: A Challenge in ICCVW2021. | 2021, Leader |
| ○ 3rd Place on Track4, 5th AI City Challenge in CVPRW2021. | 2021, Leader |
| ○ Meritorious Winner, MCM/ICM Contest. | 2019, Leader |

Academic Service and Teaching

- **Reviewer:** IEEE TIP, TCSVT, and TGRS; ISPRS; NeurIPS 2026; ACM Multimedia 2024, 2025, 2026; ICASSP 2025.
- **Teaching Assistant, Department of Computing, The Hong Kong Polytechnic University** 2023–2026
 2025/26: COMP3422 Creative Digital Media Design; COMP3424 Digital Twins: Simulation and Case Studies.
 2024/25: COMP1002 Computational Thinking and Problem Solving; COMP6706 Advanced Topics in Visual Computing.
 2023/24: COMP3011 Design and Analysis of Algorithms; COMP5112 Data Structures and Database Systems.
 Recipient of the Most Appreciated Teaching Assistant (MATA) Award, 2024.