

HUAN WANG

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BIOGRAPHY

I am a third-year (final) PhD candidate affiliated with the University of Wollongong (UOW), under the supervision of Prof. Jun Shen and Prof. Jun Yan. I also work closely with Prof. Guansong Pang at the Singapore Management University. Previously, I received my Master's degree at the Xidian University, advised by Prof. Lijuan Wang. My current research focus is on **Efficient/Faithful Agentic Reasoning** and **Generalized Anomaly/Risk Detection**.

RECENT PUBLICATIONS

- **Huan Wang**, Jun Shen, et al., Guansong Pang. “*FedHPro: Federated Hyper-Prototype Learning via Gradient Matching*”. In: **ICML’26 (CORE A*)**. July 6 – June 11, 2026, Seoul.
- **Huan Wang**, Jun Shen, et al., Guansong Pang. “*Domain-Skewed Federated Learning with Feature Decoupling and Calibration*”. In: **CVPR’26 (CORE A*)**. June 3 – June 7, 2026, Denver.
- **Huan Wang**, et al., Jun Shen. “*Towards Zero-Shot Diabetic Retinopathy Grading: Learning Generalized Knowledge via Prompt-Driven Matching and Emulating*”. In: **AAAI’26 Oral (CORE A*)**, 2026, Singapore.
- **Huan Wang**, et al., Jun Shen. “*FedDifRC: Unlocking the Potential of Text-to-Image Diffusion Models in Heterogeneous Federated Learning*”. In: **ICCV’25 (CORE A*)**. Oct 19 – Oct 23, 2025, Honolulu.
- **Huan Wang**, et al., Jun Shen. “*FedSC: Federated Learning with Semantic-Aware Collaboration*”. In: **ACM KDD’25 Oral (CORE A*)**. August 3 – August 7, 2025, Toronto.
- **Huan Wang**, et al., Jun Shen. “*Dual Visual Prompting with Context-Modulated Diffusion Prompts*”. In: **IEEE Transactions on Multimedia (CORE A*)**, 2026.
- **Huan Wang**, et al., Jun Shen. “*FedSKC: Federated Learning with Non-IID Data via Structural Knowledge Collaboration*”. In: **ICWS’25 (CORE A)**. July 7 – July 12, 2025, Helsinki.
- Haoran Li*, Xingjian Li*, **Huan Wang***, et al., Jun Shen, Min Xu. “*3D Domain Adaptation for Cryo-Electron Tomography Segmentation*”. In: **International Journal of Computer Vision (CORE A*)**, 2026.

RESEARCH INTERESTS

My research areas focus on leveraging deep learning techniques to build **Trustworthy AI**, including:

1. **Efficient Agentic Reasoning**: I focus on developing reliable and proactive safety mechanisms for multi-agent reasoning systems. In particular, my works mainly explore 1) how to identify faulty agents and critical error-inducing steps in reasoning trajectories, 2) detect potential failures online from partially completed reasoning histories, and 3) refine contextual information to prevent error propagation and improve task robustness.
2. **Generalized Anomaly/Risk Detection**: I focus on developing robust anomaly detection methods for open-world scenarios involving unknown categories, distribution shifts, and diverse anomaly patterns. In particular, my works mainly explore how to learn transferable and discriminative deviation representations that generalize to unseen, cross-domain, and complex anomalies/latent risk factors from large-scale data.
3. **Heterogeneous Federated Learning**: I focus on developing efficient and robust heterogeneous FL methods to address non-IID data and client-side model heterogeneity. In particular, my works mainly explore knowledge decoupling and calibration to improve model generalizability, fairness, and stability while preserving privacy.

SERVICES AND AWARDS

- **Program Committee (Selected)**: ICCV, CVPR, NeurIPS, KDD, AAI, ICML, ECCV, ICLR
- **Journal Reviewer (Selected)**: IEEE TIP, TMM, TNNLS, TPAMI
- **Student Travel Award**, ICCV 2025 (Honolulu), KDD 2025 (Toronto)
- **Silver Reviewer**, International Conference on Machine Learning (ICML), 2026, Seoul
- **Outstanding Program Committee**, AAI Conference on Artificial Intelligence (AAI), 2026, Singapore
- **Outstanding Reviewer**, Computer Vision and Pattern Recognition Conference (CVPR), 2025, Nashville

EDUCATION

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|---|--------------------------------|-------------------|
| • Singapore Management University | Information Science (Visiting) | 12/2025 - 01/2027 |
| • University of Wollongong | Information Science (PhD) | 02/2024 - 02/2027 |
| • Xidian University | Computer Science (Master) | 09/2020 - 06/2023 |
| • Anhui University of Science Technology | Computer Science (Bachelor) | 09/2016 - 06/2020 |