Yanhui Guo

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EDUCATION BACKGROUND

(Ph.D.) McMaster University **Hamilton, ON, Canada**
Computer Science, Image/Video Restoration, 2D/3D Computer Vision, LLM and Generative AI

(B.Sc./M.Sc.) Huazhong University of Science and Technology **Wuhan, China**
Artificial Intelligence and Automation

My research interests lie in computer vision and machine learning, especially in image restoration, video understanding, and 2D/3D content generation. Since joining the industry, I have been working on search and recommendation systems, while exploring creative generation with images and videos.

PROFESSIONAL EXPERIENCE

7+ YOE in industy w/ focus on Deep Learning, Computer Vision, Search, and Recommendation

Amazon, US **Seattle, United States**
Applied Scientist *May. 2024- Present*

- Building ranking models and running A/B tests to enhance the search experience for global customers in Amazon's emerging stores.
- Leveraging LLMs to reduce irrelevant results in a multi-stage search framework.
- Developing foundational personalization models based on customer behavior to enable personalized search experiences.
- Building substitute recommendation pipelines using multilingual, multimodal LLMs to improve shopping experiences in Amazon's emerging marketplaces.
- Working on Agentic AI to develop image and video creation tools for marketing purposes.

Noah's Ark Lab (AI Lab), Canada **Toronto, Canada**
Senior Researcher *Sep. 2023- April. 2024*

- Research on multi-view consistent inpainting algorithms.
- Research on 4D dynamic scene editing with Gaussian splatting.
- Three US patents on video understanding and 3D content generation.

Amazon, US **Seattle, United States**
Applied Scientist *June. 2023- Sep. 2023*

- Research on large language models and prompt tuning.
- One paper on continual prompt tuning (NAACL 2024).
- Developed attribute extraction models for product recommendation.

Noah's Ark Lab (AI Lab), Canada **Toronto, Canada**
Researcher *Feb. 2022- June. 2023*

- Developed and delivered video understanding models for video search in Petal Search.
- Won runner-up in the Video ActivityNet Challenge (CVPR 2022).
- Research on 3D shape reconstruction and video understanding.
- One paper on text-to-driven 3D generation (NeurIPS 2023).

NetEase Games, AI Lab **Hangzhou, China**
Artificial Intelligence Engineer *July. 2019-Jan. 2020*

- Developed a deep motion generation model for automatic 3D digital human animation.
- Worked on feature engineering and product recommendation models based on language and vision features.

The Hong Kong Polytechnic University **Hong Kong, China**
Research Staff *Jan. 2019-July. 2019*

- Worked on the robotic system of micro-drones and navigation algorithms.
- Developed dynamic obstacle avoidance algorithms for flying robots.

Tencent, Game AI Group **Shenzhen, China**
Machine Learning Engineer *Apr. 2018-July. 2018*

SELECTED RESEARCH PROJECTS

Unified Cross-domain Recommender System *Amazon, Seattle, US*

- Building an end-to-end unified cross-domain recommendation system that understands customer behavior across different platforms enables the system to discover groups of titles that customers have niche interests in.

Conversational Multi-Constraint Multi-Item Recommender System *Amazon, Seattle, US*

- Research on building a recommendation system that allows customers to put multiple shopping requirements in a single query and deliver good recommendation bundles to the customers. (Under Review, ICLR 2026)

Universal User Representations for Personalization *Amazon, Seattle, US*

- Conducting research to develop an LLM-based universal representation of customer preferences for products, enabling efficient transfer learning across multiple tasks in recommendation.

Continual Prompt Tuning for Large Language Models *Amazon, Seattle, US*

- Research on the application of prompt tuning for LLMs. We developed a queue-based continual prompt tuning method and text-based attribute extraction models for product recommendation.

Text-driven Real-world Mesh Retexturing *Noah's Ark Lab, Canada*

- Developed an easy-to-use tool to create and edit 3D objects from real-world images and a text-driven algorithm for mesh retexturing. (Two US patents, NeurIPS 2023)

AI Medical Assistant with Large Language Models *McMaster Children's Hospital*

- Turned an LLM (GPT 4) into a helpful medical assistant by giving customized demonstrations as prompts, which can help doctors summarize the diagnosis and treatment records of patients.

Temporal Action Localization in Untrimmed Videos for Video Search *Noah's Ark Lab, Canada*

- Developed efficient temporal action localization models and model blending methods for the action localization task for video search. (One US patent, winning second prize in CVPRW 2022)

PUBLICATIONS

Natural Language Processing

[1] **Yanhui Guo**, Shaoyuan Xu, Jinmiao Fu, Bryan Wang. "Q-Tuning: Continual Queue-based Prompt Tuning for Language Models", (**NAACL 2024**)(Paper Link).

Search and Recommendation

[2] Dazhou Yu, **Yanhui Guo**, "Satisfying Complex User Needs: M^3 Agent for Conversational Multi-Item Recommendation" (**Under Review, ICLR 2026**).

[3] Junting Wang, ... **Yanhui Guo**, Multi-modal Relational Item Representation Learning for Substitutable and Complementary Recommendation (**Amazon Machine Learning Conference 2025**)

[4] Mingdai, Fan Yang, **Yanhui Guo**, and et al., "PCL: Prompt-based Continual Learning for User Modeling in Recommender Systems", (**WWW 2025**)(Paper Link).

Computer Vision

[5] **Yanhui Guo**, Chenghuan Guo, Yan Gao, Yi Sun, "Learning by Taking Notes: Memory-Guided Continual Learning for Generative Multimodal Models" (**ICCV 2025 MMFM4**)

[6] Binh M Le, ... **Yanhui Guo** and etc., "QID: Efficient query-informed ViTs in data-scarce regimes for OCR-free visual document understanding" (**CVPR 2025 MULA**)

[7] **Yanhui Guo**, Fangzhou Luo, Xiaolin Wu. " Learning Degradation Independent Representations for Camera ISP Pipelines", (**CVPR 2024**)(Paper Link).

[8] Fangzhou Luo, **Yanhui Guo**, and Xiaolin Wu. "AND: Adversarial Neural Degradation for Learning Blind Image Super-Resolution", (**NeurIPS 2023**)(Paper Link).

[9] **Yanhui Guo**, Fangzhou Luo, Shaoyuan Xu. "Self-Supervised Face Image Restoration with a One-Shot Reference", (**ICASSP 2024, Oral**)(Paper Link).

[10] **Yanhui Guo**, Peng Dai, Juwei Lu and Li Cheng. "Refining Implicit Neural Action Field for Temporal Action Localization", (**A US patent**, **CVPR Workshop 2022**)(Paper Link).

[11] **Yanhui Guo**, Xiao Shu and Xiaolin Wu. "Data Acquisition for Dual-reference Deep Learning of Image Super-Resolution", (**Transactions on Image Processing (TIP)**)(Paper Link).

[12] Fangzhou Luo, **Yanhui Guo** and Xiaolin Wu. "Functional Neural Networks for Parametric Image Restoration Problems", (**NeurIPS 2021**)(Paper Link).

[13] **Yanhui Guo**, Xi Zhang and Xiaolin Wu. "Deep Multi-modality Soft-decoding of Very Low Bit-rate Face Videos", 2020 ACM International Conference on Multimedia (**ACM MM 2020**)(Paper Link).

Generative AI

[14] Hengkang Wang, ... **Yanhui Guo**, "Temporal-Consistent Video Restoration with Pre-trained Diffusion Models" (Under Review, AAAI 2026).

[15] Lingjing Kong,...**Yanhui Guo**, "Learning to Compose the Unseen Combinations: Compositional Generalization through Hierarchical Concept Models" (**Amazon Machine Learning Conference 2025**)

[16] **Yanhui Guo**, Xinxin Zuo, Peng Dai, and et al., "Decorate3D: Text-Driven High-Quality Texture Generation for Mesh Decoration in the Wild", (**Two US patents**, **NeurIPS 2023**)(Project, Paper Link).

Others

- Journal/Conference Reviewer: Amazon AMLC, CVPR 2022, ICML 2022, NeurIPS 2022, ECCV 2022/2024, CVPR 2023, ICME 2024, WACV 2024/2025, CVPR 2024/2025/2026, NeurIPS 2025.
- Coding Skills: Python, C++, PyTorch, Tensorflow, AWS Services, Spark, SQL, Git, OpenCV, Unity3D