Xiangrui Liu

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Education

Arizona State University — Tempe, USA
Ph.D. of Computer Science — *2024 - now*
Supervisor: *Dr. Yezhou Yang*

University of British Columbia — Kelowna, Canada
Master of Applied Science in Electrical Engineering — *2022 - 2024*
Supervisor: *Dr. Julian Cheng, Dr. Shan Du*

University of British Columbia — Kelowna, Canada
Bachelor of Applied Science — *2016 - 2020*

Research Experience

AI Generated Video Forensics
Microsoft, USA — *Jan 2026–now*

- Curating a large-scale benchmark for AI-generated and edited video detection, focusing on SOTA generative models to evaluate detectors.
- Designing a detection framework to identify temporal inconsistencies and spatial artifacts in manipulated content.

Identity Preserved Long Video Editing
Pixocial Technology, USA — *Oct 2025–now*

- Developing a diffusion-based video editing framework focused on maintaining temporal consistency and identity preservation across long sequences.
- Analyzing facial feature degradation over time in latent space.
- Designing a metric that measures identity preservation.
- Applying feature anchoring and researching the use of self-forcing to improve identity preservation.
- Designing a LoRA adapter to align the latent distribution of edited characters with the original subject's manifold.

Virtual Insomnia Patient Language Model
Arizona State University, University of Arizona, University of North Texas, USA — *Jan 2026–May 2026*

- Develop an AI-based virtual patient to support therapist training.
- Architecting a real-time RAG pipeline to ensure medical accuracy and consistency across complex, high-stakes insomnia diagnostic scenarios.
- The AI patient will be capable of real-time Q&A across a wide range of insomnia-related scenarios.

Video Relighting Model
Pixocial Technology, USA — *May 2025–Oct 2025*

- Develop a novel training-free framework for high-resolution video relighting model that can be adapted to different video diffusion backbones.
- The framework integrates a lightness-prior–anchored diffusion scheme, a Hybrid Motion-Adaptive Lighting Smoothing Filter, and a LAB-based Detail Fusion module to achieve flicker-free and detail-preserving results.
- The framework achieved 80% improvement in lighting stability and 56% improvement in detail preservation compared to prior methods, setting the new SOTA.

Hallucination in Vision-language Model
Intel Lab, USA — *Nov 2024–April 2025*

- Investigate the hallucination problem in VLM from a cognitive bias perspective.
- Develop and curate a benchmark to systematically evaluate model reliability, and conduct extensive experiments on SOTA models.
- Analyze underlying causes of hallucination and provide insights toward mitigating the issue.

3D Talking Head
Laboratory for Computational Vision and Intelligence, UBC, Canada — *May 2023–Sept 2023*

- Assisted in developing a data-driven 3D-aware face generation model with diverse applications such as telepresence, face image editing, and cartoon face style generation. Data preparation and preprocessing. Reproduced existing solutions for comparison and research purposes.

Marine Mammal Sound Classification
UBC, Canada — *July 2022–Sept 2023*

- Developed a high-speed marine mammals' sound classifier that obtains state-of-the-art accuracy and efficiency.
- Increased the robustness using speaker embedding. Propose a temperature cooling knowledge distillation strategy to train a pruned student model.

Publications[1]

[**CVPR 2026**]: **X. Liu**, H. Li, Y. Yang. Hi-Light: A Path to High-fidelity, High-resolution Video Relighting with a Novel Evaluation Paradigm.

[**NeurIPS 2025, UrbanAI**]: **X. Liu***, L. Chao*, M. Shivakoti, T. Kutralingam, Y. Yang, H. Wei. "ShadeBench: A Benchmark Dataset and Method for Shade Simulation in Sustainable Society."

[**IJCAI 2025**]: **X. Liu***, L. Chao*, M. Shivakoti, Y. Yang, H. Wei. "DeepShade: Enable Shade Simulation by Text-conditioned Image Generation."

[**AAAI 2024**]: **X. Liu**, X. Liu, J. Cheng, S. Du. "Hear You Say You: An Efficient Framework For Marine Mammal Sounds' Classification."

[**Neurocomputing**]: A. Salari, A. Djavadifar, **X. Liu**, and H. Najjaran, "Object recognition datasets and challenges: A Review."

[**NeurIPS 2021**]: J. Bin, R. Zhang, C. Zhang, **X. Liu**, S. Du, E. Blasch, and Z. Liu, "Improved Object Detection in Thermal Imaging Through Context Enhancement and Information Fusion: A Case Study in Autonomous Driving."

[**In Submission**]: **X. Liu**, et al. "Evaluating AI-Manipulated Video Detectors under Real-World Distribution Shifts"

[**In Submission**]: **X. Liu**, et al. "How Scaling VLMs Trades Cognitive Biases." (arxiv.org/abs/2507.03123)

[**In Submission**]: **X. Liu**, et al. "Foundation Model in Biomedicine." (arxiv.org/abs/2503.02104)

[**In Submission**]: **X. Liu***, G. Chrit*, et al. From Single-Modal to Multi-Modal: A Review on Automatic Analysis of Students' Engagement."

Professional Experience

AI Research Intern

GE Healthcare, USA *May 2025–now*

- Conduct research in video forensics, focusing on identifying AI-synthetic and manipulated video content.
- Develop artifact based detection models by analyzing low-level visual representations and temporal inconsistencies across video frames.
- Post-train a VLM on video datasets with chain of thought reasoning to improve explainability in fake video detection.
- Fine tune VLMs on curated datasets to enhance reasoning driven classification of real versus synthetic videos.
- Apply reinforcement learning techniques to refine reasoning quality and improve robustness of model generated explanations.

Research Assistant

UBC, Canada *May 2023–May 2024*

- Conducted research on 3D face generation, students' engagement analysis in the classroom and AIGC detection.
- Designed a deep learning course for graduate students: PowerPoint slides, assignment questions, exam papers, and projects.

Research Intern

AISpeech Co. Ltd., China *Aug 2021–Nov 2021*

- Developed a voice activity detection model for multiple scenarios.
- Introduced speaker adaptation to the model. Improved the 1600-hours-audio model's accuracy by 3% absolute value.

Research Intern

Suzhou Privacy Technology Co. Ltd., China *Sept 2020–April 2021*

- Researched and developed a multi-lingual multi-class speech emotion classifier.
- The feature engineering solves the imbalanced problem and reduces the model parameters by 85%.
- Compared to the Baseline of MEC2017, the classifier has 36% enhanced in precision and 123% in recall.

Academic Service

- WWW reviewer - 2026
- ACL reviewer - 2025
- CVPR reviewer - 2025
- ICCV reviewer - 2025
- NeurIPS reviewer - 2025

[1] Full publication list can be found in my Google Scholar.