Ke Xing

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Education

B.S. Student. Beijing Jiaotong University, China **2022.9 – Now**

Computer Science and Technology Advisor: Prof. Yunchao Wei

Research interests in 3D/4D Generation and Reconstruction

Research Experience

Protein Sequence Classification 2023.04 – 2024.04

Inspired by the remarkable sequence processing capabilities of pre-trained NLP models like BERT, we investigated applying BERT, pre-trained on large-scale protein sequence datasets and fine-tuned on domain-specific data, to address protein sequence classification within specific domains.

Video Distortion Correction 2024.05 – 2025.04

While wide-angle lenses enable the capture of a broader field of view in both static images and video sequences, their intrinsic optical imaging principles inherently result in substantial visual distortion. This research focuses on developing a method for correcting these distorted video sequences. Recognizing the limited availability of labeled datasets for distorted videos, our approach initiates by training a distorted image correction model, leveraging a diffusion model to accurately predict optical flow. The knowledge acquired by this image-based model is then effectively transferred to a distorted video correction model via a combination of pseudo-labeling and the enforcement of temporal optical flow consistency.

4D Scene Generation and Reconstruction 2024.02 – 2025.07

The rapid advancement and widespread adoption of VR/AR technologies have driven a growing demand for high-quality, immersive dynamic scenes. To meet this need, we introduce a novel dual-branch architecture for panoramic video generation, which we then lift into the 4D domain via spatial-temporal alignment reconstruction. Our architecture comprises a perspective branch that controls local content generation and ensures diversity, and a panorama branch that manages global content generation and maintains consistency. The spatial-temporal alignment reconstruction step specifically aims to convert the panoramic video into a 4D field while preserving both spatial and temporal coherence.

Publications

- **Ke Xing***, Hanwen Liang*, Dejia Xu, Yuyang Yin, Konstantinos N. Plataniotis, Yao Zhao, Yunchao Wei. "TiP4GEN: Text to Immersive Panorama 4D Scene Generation." **ACM Multimedia, 2025, CCF-A**.
- Ana Martínez Gascueña, Haiyang Wu, Rui Wang, C David Owen, Pedro J Hernando, Serena Monaco, Matthew Penner, **Ke Xing** et al. "Exploring the sequence-function space of microbial fucosidases." **Nature Communications Chemistry, 2024**.
- Wenbo Nie, Lang Nie, Chunyu Lin, Jingwen Chen, **Ke Xing**, Jiyuan Wang, Kang Liao, Yao Zhao. "Beyond Wide-Angle Images: Structure-to-Detail Video Portrait Correction via Unsupervised Spatiotemporal Adaptation." **AAAI, 2026, CCF-A, Submission**.

Awards

- Patents: Methods and Systems for Enzyme Substrate Specificity Prediction with Self-supervised Deep Learning, 2024.
- Software copyright: GH29 family protease function prediction software V1.0 based on deep learning, 2024.
- The MCM/ICM S Award, 2023.
- National award of Beijing Jiaotong University College Student Innovation and Entrepreneurship Competition, 2023.