

Kaihua Chen

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EDUCATION

Carnegie Mellon University - School of Computer Science

Pittsburgh, PA

Master of Science in Computer Vision - GPA: 4.17/4.00

Dec 2024

Courses: Machine Learning, 3D Vision, Generative Models, Visual Learning, Math for Robotics

China Agricultural University

Beijing, China

Bachelor of Engineering in Computer Science (Minor: Mathematics) - GPA: 3.90/4.00

Jul 2023

RESEARCH EXPERIENCE

Carnegie Mellon University

Pittsburgh, PA

Research Associate @Deva's Lab, advised by [Prof. Deva Ramanan](#)

Jan 2024 - Present

4D Novel View Synthesis from Monocular Video Using Video Diffusion

- Design video diffusion model to synthesize dynamic scenes from any novel camera trajectories using monocular video, by inpainting and deblurring MegaSAM point cloud renders, fine-tuned on web-scale self-supervised data

Diffusion Priors for Video Amodal Segmentation | [Paper1](#) | [Paper2](#)

- Developed video diffusion model to synthesize wholes of partially or fully occluded objects, enabling user-interactive amodal segmentation and content completion in videos
- Established TAO-Amodal Masks benchmark by evaluating baselines, including fine-tuned amodal segmentors, self-supervised completion algorithms, and ViT regression models

University of Toronto

Toronto, ON, Canada

ML Research Intern @Lin Brain Lab

Jul 2022 - Oct 2022

Correlating Human Neural Activity and Behaviors by Machine Learning | [Report](#) | [Abstract](#)

- Investigated correlations between fMRI brain imaging, EEG signals, natural stimuli, and subjective feelings, employing a spherical convolution-based UNet and LSTM autoencoder pretrained on HCP emotion tasks

China Agricultural University

Beijing, China

Undergraduate Researcher @Department of Computer Science

Apr 2021 - Mar 2022

AI-Powered Facial Behavior Analysis | [Report](#) | [Paper](#)

- Innovated a Graph-Temporal Convolutional Network (GTCN) for real-time drowsiness detection based on facial keypoints recognized by OpenPose, achieving a 2.6% accuracy improvement on YawDD compared with SOTA
- Integrated drowsiness and emotion recognition system on Raspberry Pi, resulting in software copyright and patent

ACADEMIC PROJECTS

Zero-shot Monocular Metric Depth Estimation (CMU 16-825 Course Project) | [Paper](#)

Jan 2024 - May 2024

- Developed a zero-shot adaptation method for MMDE using generative painting and human mesh recovery, achieving strong generalization in unseen scenes

Robust 3D Surface Reconstruction (CMU 16-811 Course Project) | [Github](#) | [Report](#)

Oct 2023 - Dec 2023

- Implemented Poisson Surface Reconstruction in Python, introducing a random adaptive resampling technique to address highly non-uniform point clouds

Intelligent Bitcoin and Gold Trading Strategy (2022 MCM Finalist Award) | [Paper](#)

Feb 2022

- Devised a trading strategy based on temporal deep learning prediction and greedy Markov decision process, achieving 30x return in simulated trading

IoT System for Greenhouse Environment Monitoring

Apr 2020 - Mar 2021

- Constructed an Arduino UNO-based IoT system featuring a PyQt GUI, enabling data collection, wireless transmission, and remote control, and obtained software copyright

PUBLICATIONS

[1] **Kaihua Chen**, Deva Ramanan, Tarasha Khurana, "Using Diffusion Priors for Video Amodal Segmentation," in *CVPR*, 2025. Accepted | [Preprint](#)

[2] Cheng-Yen Hsieh, **Kaihua Chen**, Achal Dave, Tarasha Khurana, Deva Ramanan, "TAO-Amodal: A Benchmark for Tracking Any Object Amodally," in *arXiv*, 2024. Submitted | [Preprint](#)

[3] Yizhou Zhao, Hengwei Bian, **Kaihua Chen**, et al., "Metric from Human: Zero-shot Monocular Metric Depth Estimation via Test-time Adaptation," in *NeurIPS*, 2024. Published | [Link](#)

[4] **Kaihua Chen**, Tingting Zhu, Shaofeng Li, Yinxue Shi, "Real-time Yawning Detection Based on Time Series Classification using Facial Feature Points," in *3rd IEEE HPBD&IS*, 2021. Published | [Link](#)

SKILLS

Programming Languages: Python (Proficient); C/C++, Java, MATLAB, SQL (Familiar)

Frameworks and Tools: PyTorch, Diffusers, TensorFlow, Scikit-learn, NumPy, Matplotlib, OpenCV, Open3D, Git

Environments and Platforms: Linux, Windows, Arduino, Raspberry Pi