KAIYING HAN

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github: original-doc

EDUCATION

The Chinese University of Hong Kong, Shenzhen *September 2021 - Present*
Bachelor in Computer Engineering, 2025
Dean List Award Student

Core Course: 3D Data Processing Computer Graphics Operating System Computer Networks Computer Architecture Microprocessors and Computer Systems Database Systems Signals and Systems

SKILLS

Programming Languages	Python, MySQL, Bash, C/C++, Verilog, VHDL
Python Packages	Pandas, Matplotlib, Numpy, Scipy, Pytorch, Opencv, Opengl, Open3d, Jupyter
Software & Tools	HTML, LaTeX, Excel, MATLAB, Git

RESEARCH

FishSense: Underwater Fish Segmentation July 2024 - Present
UC San Diego *Supervised by Prof. Ryan Kastner*

- Developed an innovative pipeline for underwater fish segmentation using depth-guided vision transformers (ViT) and the Segment Anything Model (SAM) for precise fish mask generation.
- Integrated depth estimation to enhance underwater semantic segmentation accuracy and efficiency.
- Designed custom multi-layer perceptrons (MLP) to mitigate underwater image distortions, improving segmentation performance in challenging aquatic conditions.

LiveVV: Streaming system for volumetric videos September 2023 - March 2024
CUHK Shenzhen *Supervided by Prof. Fangxin Wang*

- Architected holistic live volumetric video streaming system with multi-view capture, segmentation, adaptive transmission, and rendering.
- Pioneered adaptable volumetric video generation using body tracking neural networks and skeleton data for camera calibration.
- Optimized bandwidth via adaptive segmentation/decimation leveraging body information. Conducted experiments balancing visual performance and bandwidth efficiency.

PROJECT

Smooth Mesh Estimation

- Developed a real-time 3D mesh reconstruction algorithm using depth data and sparse landmarks from visual odometry.
- Implemented a non-smooth convex optimization problem solved with a primal-dual method for generating smooth and accurate 3D meshes.
- Github: Smooth Mesh Estimation

Natural Language Query System for Supermarket Database

- Integrated Large Language Model (LLM) technology with a supermarket database, enabling natural language queries and implementing Retrieval-Augmented Generation (RAG).
- Designed and developed a user-friendly front-end interface for seamless human-computer interaction.

· Github: Natural Language Query System for Supermarket Database

PUBLICATION

LiveVV: Human-Centered Live Volumetric Video Streaming System

A novel system enabling real-time streaming of volumetric video for XR applications. Our approach combines efficient capture, segmentation, and adaptive transmission techniques to achieve 24 fps playback with sub-350ms latency.

DOI: LiveVV: Human-Centered Live Volumetric Video Streaming System