Tianxin Huang

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Experience

- **The University of Hong Kong** *HKU CDS* 2025 – Now Postdoc Fellow
- **National University of Singapore** *NUS School of Computing* 2023 -- 2025 Research Fellow
- **Tencent** *Youtu AI Lab* 2022 -- 2023 Research Intern
- **Zhejiang University** *Control Science and Engineering* 2017 -- 2023 Doctor's Degree
- **Xi'an Jiaotong University** *Mechanical Engineering* 2013 -- 2017 Bachelor's Degree

Interested Areas

- **3D Geometry Analysis/Point Cloud Processing**
- **3D Digital Human/Human Face Modeling**
- **3D/4D Generation/Scene Reconstruction**

Research

- **FreeSplat++: Generalizable 3D Gaussian Splatting for Efficient Indoor Scene Reconstruction (Arxiv'25)(Wang, Huang et al.)**
  – An improved version of FreeSplat, which proposes a systematic framework to reconstruct the whole indoor scene based on a generalizable manner. The Gaussian Primitives of whole scene are gradually predicted and refined through a post-optimization process.
- **PoseCrafter: Extreme Pose Estimation with Hybrid Video Synthesis(NeurIPS'25)(Mao, Huang et al.)**
  – A simple but effective test-time framework trying to apply the priors from video generation model to the estimation of camera poses between frames with small or none overlaps.
- **Unified Geometry and Color Compression Framework for Point Clouds via Generative Diffusion Priors (3DV'26)(Huang et al.)**
  – A new test-time framework introducing pre-trained generative diffusion priors to compress both the geometry and color attributes of point clouds in an unified manner.
- **ComPC: Completing a 3D Point Cloud with 2D Diffusion Priors (ICLR'25)(Huang et al.)**
  – A new framework to synthesize 3D shapes from incomplete points by integrating priors from a pose-conditioned 2D diffusion model using Gaussian Splatting. This approach resembles an optimization-based point-to-point 3D generation process.
- **Learning to Decouple the Lights for 3D Face Texture Modeling (NeurIPS'24)(Huang et al.)**
  – Learning to imitate the illumination affected by external occlusions with multiple local illumination conditions combined with optimizable neural networks. In this way, this method can avoid the influences of external shadows on modeled 3D face textures.
- **FreeSplat: Generalizable 3D Gaussian Splatting Towards Free-View Synthesis of Indoor Scenes (NeurIPS'24)((Wang, Huang et al.))**

- A method enhancing 3D Gaussian Splatting with a novel framework for free-view synthesis, using low-cost cross-view aggregation, pixel-wise triplet fusion, and an effective free-view training strategy, resulting in state-of-the-art novel view synthesis performance, efficient inference, and reduced redundancy in large scene reconstruction.

- **3D Point Cloud Geometry Compression On Deep Learning (ACM MM'19 Oral)(Huang et al.)**
  - A simple and early framework to compress small and sparse point cloud objects with PointNet++ feature extraction and sparse coding, whose robustness is limited and cannot process different spatial distributions from training data.

- **3QNet: 3D Point Cloud Geometry Quantization Compression Network(SGA'22)(Huang et al.)**
  - An universal purely point-based point clouds compression framework applicable to point clouds with multiple spatial distributions including dense objects, indoor and outdoor scenes.

- **RFNet: Recurrent Forward Network for Dense Point Cloud Completion (ICCV'21)(Huang et al.)**
  - A efficient dense point cloud completion network achieved by completing the point clouds recurrently and merging the completed results with partial input to preserve original shape details.

- **Learning to measure the point cloud reconstruction loss in a representation space (CVPR'23) (Huang et al.)**
  - Learning to extract a global representation which can be used to evaluate the point cloud shape differences with contrastive learning to learn similar shape characteristic and adversarial strategy to find out the shape differences.

- **Learning to Train a Point Cloud Reconstruction Network without Matching (ECCV'22) (Huang et al.)**
  - A learning-based loss function dynamically updated with point cloud reconstruction-related networks including reconstruction/completion/unsupervised classification to avoid the possible biases in existing matching-based losses.

- **Resolution-free Point Cloud Sampling Network with Data Distillation (ECCV'22)(Huang et al.)**
  - Improving the performances of driving-based sampling network by using FPS sampled points and promoting the network structures, while distillation losses are introduced for extra supervision.

- **Adaptive Recurrent Forward Network for Dense Point Cloud Completion (TMM)(Huang et al.)**
  - Based on RFNet, ARFNet is proposed by replacing the merging operation controlled by a few learnable parameters with more flexible networks.

- **Learnable Chamfer Distance for point cloud reconstruction (PRL)(Huang et al.)**
  - A method making the Chamfer Distance learnable by predicting weights for different point-to-point distances between point clouds, which can achieve faster convergence to better results.

- **Deep Residual Surrogate Model (Information Sciences)(Huang et al.)**
  - A hybrid surrogate model achieved by adaptively selecting and assembling multiple simple surrogate models, which can model complex functions with a small amount of sampled points.

- **Semantic Segmentation-assisted Scene Completion for LiDAR Point Clouds (IROS'21) (Yang, Zou, Huang et al.)**
  - Combining the 2D and 3D scene semantic completion frameworks, where the 3D geometrical features are injected into 2D BEV to improve performances. During inference, the 3D prediction branch is dropped to guarantee the efficiency.