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Profile

I am currently an assistant professor at Shanghai Jiao Tong University. I have research experience in 3D computer vision, foundational models, and healthcare. With an interdisciplinary background in computer vision, large models, and AI for science, I am dedicated to developing a new generation of artificial intelligence technology that empowers life, health, and general artificial intelligence.

My research interests encompass general artificial intelligence, 3D computer vision and AI applications in healthcare.

Work Experience

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| Assistant Professor , [Shanghai Jiao Tong University] | Shanghai, CN 06/2024 - present |
| ▪ Research, Teaching and Service | |
| Research Fellow , [Shanghai Artificial Intelligence Laboratory] | Shanghai, CN 03/2022 - 06/2024 |
| ▪ Research and Engineering | |
| Research Associate , [The University of Sydney] | Sydney, AU 09/2019 - 03/2022 |
| ▪ Research and Supervising | |
| Research Fellow , [University of Technology, Sydney] | Sydney, AU 01/2019 - 09/2019 |
| ▪ Research and Teaching | |
| Research Assistant , [Tsinghua University] | Shenzhen, CN 02/2014 - 02/2015 |
| ▪ Research | |

Education

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| Ph.D. Computer Science <i>University of Technology Sydney</i> | Sydney, AU 2015 - 2019 |
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Selected Patents

- Lixin Fan, Xiaoshui Huang, Qiang Wu, Jian Zhang. Point cloud matching method. 2020.09, US10776936B2. US patent.
- 黄小水, 曲文涛, 左一帆, 欧阳万里. 一种用于点云理解的调优系统及方法. 专利公开号: CN115187710A. 2022.
- 黄小水, 贺通, 欧阳万里, 黎盛, 左一帆. 用 2D 预训练模型作为 3D 下游任务主干网络的方法及系统. 专利公开号: CN115719443A. 2023.
- 黄小水, 宫永顺, 郑晓, 欧阳万里. 一种基于扩散模型的 3D 预训练方法与系统. 专利申请号: 202311085634.7. 2023.
- 黄小水, 左一帆, 黎盛, 黄洲, 欧阳万里. 一种基于稀疏专家混合模型的点云处理方法与系统. 专利申请号: 202311084717.4. 2023.

Selected Publications

Journals:

- Junjie Zhang, Yutao Rao, **Xiaoshui Huang**, Guanyi Li, Xin Zhou and Dan Zeng. Frequency-Aware Multi-Modal Fine-Tuning for Few-Shot Open-Set Remote Sensing Scene Classification. IEEE Transactions on Multimedia (TMM), 2024. (**JCR Q1**)
- Yifan Zuo, Yaping Xu, Yifeng Zeng, Yuming Fang, **Xiaoshui Huang**, Jiebin Yan. A2GSTran: Depth Map Super-resolution via Asymmetric Attention with Guidance Selection. IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2023. (**JCR Q1**)

- Zongyi Xu*, **Xiaoshui Huang***, Bo Yuan, Yangfu Wang, Qianni Zhang, Weisheng Li, Xinbo Gao. Retrieval-and-Alignment based Large-scale Indoor Point Cloud Semantic Segmentation. Science China-Information Sciences, 2023. **(JCR Q1)**
- **Xiaoshui Huang**, Guofeng Mei, Jian Zhang. Cross-source Point Cloud Registration: Challenges, Progress and Prospects. Neurocomputing, 2023. **(JCR Q1)**
- Mingyang Zhao, **Xiaoshui Huang**, Jingen Jiang, Luntian Mou, Lei Ma, Dong-Ming Yan. Accurate Registration of Cross-Modality Geometry via Consistent Clustering. IEEE Transactions on Visualization and Computer Graphics (TVCG), 2023. **(JCR Q1)**
- **Xiaoshui Huang**; Wentao Qu; Yifan Zuo; Yuming Fang; Jian Zhang; Xiaowei Zhao. GMF: General Multimodal Fusion Framework for Correspondence Outlier Rejection. IEEE Robotics and Automation Letters (RA-L), 2022. **(JCR Q1)**
- **Xiaoshui Huang**; Wentao Qu; Yifan Zuo; Yuming Fang; Jian Zhang; Xiaowei Zhao. IMFNet: Interpretable Multimodal Fusion for Point Cloud Registration. IEEE Robotics and Automation Letters (RA-L), 2022. **(JCR Q1)**
- **Xiaoshui Huang**; Yangfu Wang; Guofeng Mei; Zongyi Xu; Yucheng Wang; Mohammed Bennamoun. Robust Real-world Point Cloud Registration by Inlier Detection. Computer Vision and Image Understanding (CVIU), 2022. **(JCR Q1)**
- **Xiaoshui Huang**; Sheng Li; Yifan Zuo; Yuming Fang; Jian Zhang; Xiaowei Zhao. Unsupervised Point Cloud Registration by Learning Unified Gaussian Mixture Models. IEEE Robotics and Automation Letters (RA-L), 2022. **(JCR Q1)**
- **Xiaoshui Huang**, Lixin Fan, Qiang Wu, Jian Zhang, Chun Yuan. A coarse-to-fine algorithm for matching and registration in 3D cross-sourced point clouds. Transactions on Circuits and Systems for Video Technology (T-CSVT). 2017. **(JCR Q1)**
- **Xiaoshui Huang**, Jian Zhang, Lixin Fan, Qiang Wu, Chun Yuan. "A Systematic Approach for Cross-Source Point Cloud Registration by Preserving Macro and Micro Structures," in IEEE Transactions on Image Processing (T-IP), vol. 26, no. 7, pp. 3261-3276, July 2017. **(JCR Q1)**
- Shuchao Pang, Anan Du, Mehmet Orgun; Yan Wang; Michael Sheng; Shoujin Wang; **Xiaoshui Huang**; Zhenmei Yu. Beyond CNNs: Exploiting Further Inherent Symmetries in Medical Image Segmentation. IEEE Transactions on Cybernetics. **(JCR Q1)**
- Yifan Zuo, Hao Wang, Yuming Fang, **Xiaoshui Huang**, Xiwu Shang, Qiang Wu. "MIG-net: Multi-scale Network Alternately Guided by Intensity and Gradient Features for Depth Map Super-resolution", Accepted in IEEE Transactions Multimedia (TMM). 2021. **(JCR Q1)**
- Shoujin Wang, Longbing Cao, Liang Hu, Shlomo Berkovsky, **Xiaoshui Huang**, Lin Xiao, Wenpeng Lu. "Hierarchical attentive transaction embedding with intra- and inter-transaction dependencies for next-item recommendation". IEEE Intelligent Systems. 2020. **(JCR Q1)**

Conferences:

- Junjie Zhang, Tianci Hu, **Xiaoshui Huang**⁺, Yongshun Gong, Dan Zeng. 3DBench: A Scalable 3D Benchmark and Instruction-Tuning Dataset. IJCAI 2024. **(CCF A)**
- Yuan Yao, Yuanhan Zhang, Zhenfei Yin, Jiebo Luo, Wanli Ouyang, **Xiaoshui Huang**⁺. 3D Point Cloud Pre-training with Knowledge Distilled from 2D Images. ICME 2024. **(CCF B)**
- Cheng Zhang, Qianyi Wu, Camilo Cruz Gambardella, **Xiaoshui Huang**⁺, Dinh Phung, Wanli Ouyang, Jianfei Cai⁺. Taming Stable Diffusion for Text to 360 Panorama Image Generation. CVPR 2024. **(CCF A)**
- Wentao Qu, Yuantian Shao, Lingwu Meng, **Xiaoshui Huang**⁺, Liang Xiao⁺. A Conditional Denoising Diffusion Probabilistic Model for Point Cloud Upsampling. CVPR 2024. **(CCF A)**
- Xiao zheng, **Xiaoshui Huang**⁺, Guofeng Mei, Zhaoyang Lyu, Yuenan Hou, Wanli Ouyang, Bo Dai, Yongshun Gong⁺. Point Cloud Pre-training with Diffusion Models. CVPR 2024. **(CCF A)**

- Xiaopei Wu, Yuenan Hou, **Xiaoshui Huang**, Binbin Lin, Tong He, Xinge ZHU, Yuexin Ma, Boxi Wu, Haifeng Liu, Deng Cai, Wanli Ouyang. TASeg: Temporal Aggregation Network for LiDAR Semantic Segmentation. CVPR 2024. **(CCF A)**
- **Xiaoshui Huang**, Zhou Huang, Sheng Li, Wentao Qu, Tong He, Yuenan Hou, Yifan Zuo, Wanli Ouyang. EPCL: Frozen CLIP Transformer is An Efficient Point Cloud Encoder. AAAI 2024. **(CCF A)**
- Xiaopei Wu, Liang Peng, Liang Xie, Yuenan HOU, Binbin Lin, **Xiaoshui Huang**⁺, Haifeng Liu, Deng Cai⁺, Wanli Ouyang. Semi-Supervised 3D Object Detection with PatchTeacher and PillarMix. AAAI 2024. **(CCF A)**
- Zhenfei Yin, Jiong Wang, Jianjian Cao, Zhelun Shi, Dingning Liu, Mukai Li, Lu Sheng, **Xiaoshui Huang**, Lei Bai, Zhiyong Wang, Wanli Ouyang, Jing Shao. LAMM: Language-Assisted Multi-Modal Instruction-Tuning Dataset, Framework, and Benchmark. NeurIPS 2023. **(CCF A)**
- Tianyu Huang, Bowen Dong, Yunhan Yang, **Xiaoshui Huang**, Rynson W.H. Lau, Wanli Ouyang, Wangmeng Zuo. CLIP2Point: Transfer CLIP to Point Cloud Classification with Image-Depth Pre-training. International Conference on Computer Vision (ICCV) 2023. **(CCF A)**
- Guofeng Mei, Hao Tang, **Xiaoshui Huang**, Weijie Wang, Juan Liu, Jian Zhang, Luc Van Gool, Qiang Wu. Unsupervised Deep Probabilistic Approach for Partial Point Cloud Registration. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2023. **(CCF A)**
- Mingzhi Yuan*, **Xiaoshui Huang***, Kexue Fu*, Zhihao Li, Manning Wang. Boosting 3D Point Cloud Registration by Transferring Multi-modality Knowledge. In the 2023 IEEE International Conference on Robotics and Automation (ICRA) 2023. **(CCF B)**
- **Xiaoshui Huang**, Guofeng Mei, Jian Zhang. Feature-metric Registration: A Fast Semi-supervised Approach for Robust Point Cloud Registration without Correspondences. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020. **(CCF A)**
- **Xiaoshui Huang**, Lixin Fan, Qiang Wu, Jian Zhang, Chun Yuan. Fast Registration for cross-source point clouds by using weak regional affinity and pixel-wise refinement. International Conference of Multimedia Expro (ICME) 2019. **(CCF B)**
- **Xiaoshui Huang**, Chun Yuan, and Jian Zhang, 2015, September. Graph Cuts Stereo Matching Based on Patch-Match and Ground Control Points Constraint. In Pacific Rim Conference on Multimedia (PCM) (pp. 14-23). Springer International Publishing. **(CCF C)**
- **Xiaoshui Huang**, Jian Zhang, Qiang Wu, Lixin Fan, Chun Yuan. A coarse-to-fine algorithm for registration in 3D street-view cross-source point clouds. In 2016 International Conference on Digital Image Computing: Techniques and Applications (DICTA) (pp. 1-6). IEEE.
- **Xiaoshui Huang**, Lixin Fan, Jian Zhang, Qiang Wu, and Chun Yuan, 2016. Real Time Complete Dense Depth Reconstruction for a Monocular Camera. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW) (pp. 32-37). IEEE.
- **Xiaoshui Huang**, Jian Zhang, Qiang Wu, Chun Yuan, and Lixin Fan, 2015, November. Dense Correspondence Using Non-local DAISY Forest. In 2015 International Conference on Digital Image Computing: Techniques and Applications (DICTA) (pp. 1-8). IEEE.
- Maosheng Sun, **Xiaoshui Huang**, Zeren Sun, Qiong Wang, Yazhou Yao. Unsupervised Pre-training for 3D Object Detection with Transformer. PRCV 2022. **(CCF C)**
- Guofeng Mei, **Xiaoshui Huang**, Jian Zhang, Qiang Wu. Overlapping guided coarse-to-fine correspondence prediction for point cloud registration. ICME 2022. **(CCF B)**
- Guofeng Mei, **Xiaoshui Huang**, Jian Zhang, Qiang Wu. Partial Point Cloud Registration via Soft Segmentation. ICIP 2022. **(CCF C)**
- Guofeng Mei, **Xiaoshui Huang**, Juan Liu, Jian Zhang, Qiang Wu. Unsupervised Point Cloud Pre-training via Contrasting and Clustering. ICIP 2022. **(CCF C)**

- STEVE LING, Yujiao Wu, Steven Su, Ma Jie, **Xiaoshui Huang**. DeepMMSA: A Novel Multimodal Deep Learning Framework for Non-small Cell Lung Cancer Survival Analysis. IEEE International Conference on Systems, Man, and Cybernetics (SMC) 2021. **(CCF C)**
- Anan Du, Shuchao Pang, **Xiaoshui Huang**, Jian Zhang, Qiang Wu. Exploring long-short-term context for point cloud semantic segmentation. International Conference on Image Processing (ICIP) 2020. **(CCF C)**
- Tao Chen, Jian Zhang, Guo-Sen Xie, Yazhou Yao, **Xiaoshui Huang**, Zhenmin Tang. Classification Constrained Discriminator for Domain Adaptive Semantic Segmentation. International Conference of Multimedia Expro (ICME) 2020. **(CCF B)**
- Anan Du, **Xiaoshui Huang**, Jian Zhang, Lingxiang Yao, Qiang Wu. KPSNET: Keypoint detection and feature extraction for point cloud registration. International Conference on Image Processing (ICIP) 2019. **(CCF C)**
- Shoujin Wang, Liang Hu, Longbing Cao, **Xiaoshui Huang**, Defu Lian, Wei Liu. Attention-based Transactional Context Embedding for Next-Item Recommendation. AAAI 2018. **(CCF A)**

Academic Service

- **Associate Editor** [IEEE Robotics and Automation Letters (RA-L)]
- **Reviewer** [CVPR, ICCV, ECCV, NeurIPS, AAAI, ICLR, IJCAI, TPAMI, IJCV, TIP, TMM, TCSVT, TNNLS]