

RUNSONG ZHU

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EDUCATION

Wuhan University

Sept 2019 - Present

M. Eng. in Surveying and Mapping Engineering, *Grade: 83/100*

Central South University

Sept 2015 - Jun 2019

B. Sc. in Geographic Information Science (GIS), *Grade: 87/100 (rank 4 out of 47)*

INTERNSHIP

Tencent AI-Lab

Jun 2021 - Present

Working on surface reconstruction from multi-view images; Supervised by Dr. *Di Kang* and Dr. *Linchao Bao*

DiDi

Jun 2020 - Sept 2020

Worked on real-time bus trajectory data processing and data mining.

Chuangxin Deecamp

Jun 2019 - Aug 2019

Worked on financial time series data analysis and forecasting; Supervised by Dr. *Ji Feng*

Baidu Map

Jun 2018 - Oct 2018

Worked on the development of android test platform for “BaiduMap” APP.

RESEARCH PROJECTS

Research Interests: 3D Vision, Point Cloud Processing, Computer Graphics, Deep Learning, etc.

Human face reconstruction from limited number images (on-going)

- Aiming to efficiently and accurately extract the underlying 3D geometry from given limited number of facial images as input
- Proposing a progressive method to optimize the SDF model from a coarse-refine structure, which not only accelerates the training speed but also improves the final reconstruction quality.

Robust normal estimation for point cloud

- Aiming to accurately estimate point-wise normal vector of an input point set.
- Tackled several challenges including noisy input, severe outliers, uneven sampling density, etc.
- Outperformed DeepFit and achieved state-of-the-art performance on the PCPNet dataset (synthetic) and SceneNN dataset (real-world)
- Work accepted to ICCV 2021 (first author, oral)

Heat leakage detection by fusion of point cloud and infrared image

- Aiming to analyze the heat information around windows to detect the heat leakage, by utilizing multimodal data including point clouds and infrared images.
- Applying *harris_2d* operator (on images) and *harris_3d* operator (on point clouds) to find corner points, which are used to register the input images and point clouds via RANSAC.
- Achieving heat leakage detection by analyzing the temperature difference between the walls and the windows, which are determined in 3D from the 2D detection.

Semantics and topology representation of residential buildings

- Proposed a novel and fully automatic method to get meaningful semantics and topology representation of residential-building space using floor-plan raster maps
- Submitted to IEEE TGRS (under-view)

Segmentation for large-scale point clouds

- Designed a novel convolutional operator to process point cloud for semantic segmentation, where points are processed directly and converted to voxels simultaneously
- Work accepted to Journal of Wuhan University 2020

PUBLICATION

1. Rethinking Learning-based Normal Estimation on Point Clouds *ICCV oral, 2021*
Runsong Zhu, Liu Yuan (equal contribution), Zhen Dong, Tengping Jiang, Yuan Wang, Wenping Wang, Bisheng Yang.
2. Automated semantics and topology representation of residential-building space using floor-plan raster maps.
Under review
Bisheng Yang, Tengping Jiang, Weitong Wu, Runsong Zhu, Yuzhou Zhou, Lei Dai
3. Bievel Convolutional Neural Networks for 3D Semantic Segmentation Using Large-scale LiDAR Point clouds in Complex Environments *Journal of Wuhan University, 2020*
Tengping Jiang, Bisheng Yang, Yuzhou Zhou, Runsong Zhu, Zhen Dong.

AWARDS

- 2020 Lidar Congress - Point Cloud Segmentation Track (**First Prize**)
- 2019 Unique hackday (**Best Technology Award**)
- 2019 National GIS Development Competition (**First Prize**)
- 2018 Mathematical Contest In Modeling (**Meritorious Winner**)

PROFESSIONAL SKILLS

Programming languages: Python, Java, Matlab, C/C++

Toolkits: Pytorch, OpenGL

Languages: Mandarin (native), English (fluent)