

Yuan Liu(刘缘)

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Date of Birth	27 th Nov. 1993		

Education/Work

2018-Now	RA in State Key Lab of CAD&CG, Zhejiang University
2015-2018	M.Sc. in Photogrammetry and Remote Sensing, LIESMARS, Wuhan University
2011-2015	B.Eng. in Geodesy and Geomatics Engineering, School of Geodesy and Geomatics, Wuhan University
Grade during undergraduate study: GPA: 3.80/4.0 Rank: 2/406	

Research/Project Experience

- Jun. 2018 – Research on object pose estimation by direction field.**
Jan. 2019
- Propose a direction field representation for keypoints localization.
 - Outperform state-of-the-art on LINEMOD and YCB dataset.
- Sep. 2017 - Research on semantic segmentation of point cloud based on GCN**
May. 2018
- Design graph convolution and pooling operator for point cloud.
 - Achieve 1st on S3DIS benchmark and 2nd on Semantic3D benchmark
- Apr. 2017 – Internship in Microsoft XiaoIce team, image Sense Group.**
Aug. 2017
- Train a CNN to recognize human facial expression.
 - Writing a modular to swap faces between emoji and selfie image.
 - Research on applying GAN for face editing.
- Nov. 2016 – Kaggle competition, national conservancy fisheries monitoring.**
Apr. 2017 *Final Grade: Rank: 27/2293 (top 2%)*
- Fish detection using a Single Shot Multi-box Detector (SSD).
 - Fish categories classification by a deep model (GoogLeNet).
- Mar. 2016 – Research on local feature of LiDAR point clouds.**
Nov. 2016
- Design a novel local binary feature called Binary Kernel Descriptor for LiDAR point clouds, which is robust to point density and noise.
 - Apply BKD to road marking and road curb detection in Mobile Laser Scanning (MLS) point clouds.
- Sep. 2015 – Research on hierarchical feature for MLS point cloud object recognition.**
Mar. 2016
- Aggregate point-level, segment-level, object-level and contextual-level feature for MLS object recognition such as car, building, trees, traffics signs etc.
 - The automatic recognition can accelerate production of high accuracy driving maps for advanced driver assistance systems.

Feb. 2015 – Research on automatic registration of multi-sites Terrestrial Laser Scanning (TLS) point clouds.

- The intersection points between vertical lines and ground are detected as key points and some semantic feature are extracted for these points, and these points are matched by forming congruent triangles.
- A minimum spanning trees are used for overall registration consistent constraint.
- The proposed algorithm works well in varied scenes such as urban, suburban, forest etc.

Mar. 2015 – Develop and Maintain Point2Model, a LiDAR Point Cloud Processing software
May, 2018

- Visualize and manipulate point clouds by octree LoD structure.
- Integrated with most of above-mentioned algorithms to automatic object extraction in MLS.
- Integrated with semi-auto object recognition algorithm with human in the loop.

Publications/Proceedings

- Peng S*, **Liu Y***, Huang Q, et al. PVNet: Pixel-wise Voting Network for 6DoF Pose Estimation. In CVPR, 2019 (oral presentation). (* equal contribution)
- Yang B, **Liu Y**, Dong Z, et al. (2017). 3D local feature BKD to extract road information from mobile laser scanning point clouds [J]. ISPRS Journal of Photogrammetry and Remote Sensing, 2017, 130: 329-343.
- Dong Z, Yang B, **Liu Y**, et al. (2017). A novel binary shape context for 3D local surface description [J]. ISPRS Journal of Photogrammetry and Remote Sensing, 2017, 130: 431-452.
- Yang B, Dong Z, **Liu Y**, et al. (2017). Computing multiple aggregation levels and contextual features for road facilities recognition using mobile laser scanning data [J]. ISPRS Journal of Photogrammetry and Remote Sensing, 2017, 126: 180-194.
- Yang, B., **Liu, Y.**, Liang, F., & Dong, Z. (2016). Using mobile laser scanning data for features extraction of high accuracy driving maps. ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 433-439.
- Yang, B., Dong, Z., Liang, F., & **Liu, Y.** (2016). Automatic registration of large-scale urban scene point clouds based on semantic feature points [J]. ISPRS Journal of Photogrammetry and Remote Sensing, 113, 43-58.

Skills

Programming Languages/Frameworks

- ◆ C/C++, C#, Python, MATLAB
- ◆ MxNet, TensorFlow

Relative Basics

- ◆ Machine Learning/Deep Learning
- ◆ Computer Vision (Multi-view Geometry)