

Yuan Liu

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Education/Work

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

Research Experience

- Jan. 2019 – Now** **Research on group invariant local descriptor**
Project Leader
- Extend normal convolution to group convolution.
 - Use group CNN and bilinear pooling to extract group invariant feature
- Dec. 2018 – Now** **Research on registration of extreme object scan**
Project Member
- Register two scans without overlap using shape priors
 - Use a CNN on spherical map to inpaint a partial scan
 - Solve rotation via SO3 cost volume
- Jun. 2018 – Jan. 2019** **Research on 6D object pose estimation by direction field.**
Project Leader
- Propose a direction field based representation for keypoints localization.
 - Outperform state-of-the-art on LINEMOD and YCB dataset.
- Sep. 2017 – May. 2018** **Research on semantic segmentation of point cloud based on GCN**
Master dissertation
- Design convolution and pooling operator for point cloud.
 - Propose a network called PCSNet.
 - Achieve 1st on S3DIS benchmark and 2nd on Semantic3D benchmark
- Mar. 2016 – Nov. 2016** **Research on a novel local binary feature for road information extraction in MLS**
Project Leader
- Design a robust Binary Kernel Descriptor (BKD) using kernel weighting.
 - Use BKD to detect road marking and road curb from MLS data.
- Sep. 2015 – Mar. 2016** **Research on multi-level features for road facilities recognition in MLS.**
Project Member

- Extract and aggregate different multiple level features of point cloud
- Use features for recognition of road aside facilities and road surface

Feb. 2015 - Research on automatic registration of multi-sites TLS data.

Sep. 2015 *Project Member*

- Extraction of semantic feature for correspondence estimation
- Match two sets of triangles under the constraint of congruent triangles
- Global optimization via minimum spanning trees

Work/Competition

Apr. 2017 - Internship in Microsoft XiaoIce team, image Sense Group.

- Aug. 2017**
- Train a CNN to recognize human facial expression.
 - Writing a program for face swapping between emoji and selfie image.
 - Research on GANs 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).

May. 2015 - Development and Maintenance of Point2Model.

Jun. 2018 *Project Member*

- A software for automatic and semi-automatic map production from point clouds..
- Incorporated with all algorithms proposed in our ISPRS papers

Publications/Proceedings

- GIFT: Learning transformation-invariant dense visual descriptors via group CNNs.
Yuan Liu, Zehong Shen, Zhixuan Lin, Sida Peng, Hujun Bao, Xiaowei Zhou.
Plan to submit to NeurIPS 2019.
- Registration of Object Scans via Spherical CNNs.
Jiahui Lei, **Yuan Liu**, Srinath Sridhar, Hujun Bao, Xiaowei Zhou
Plan to submit to NeurIPS 2019.
- PVNet: Pixel-wise Voting Network for 6DoF Pose Estimation.
Sida Peng*, **Yuan Liu***, Qixing Huang, Hujun Bao, Xiaowei Zhou.
CVPR, 2019 (oral presentation). (equal contribution)*
- 3D local feature BKD to extract road information from mobile laser scanning point clouds
Bisheng Yang, **Yuan Liu**, Zhen Dong, Fuxun Liang, Bijun Li, Xiangyang Peng.
ISPRS Journal of Photogrammetry and Remote Sensing 2017.
- A novel binary shape context for 3D local surface description.
Zhen Dong, Bisheng Yang, **Yuan Liu**, Fuxun Liang, Bijun Li, Yufu Zang.
ISPRS Journal of Photogrammetry and Remote Sensing 2017.
- Computing multiple aggregation levels and contextual features for road facilities recognition using

mobile laser scanning data.

Zhen Dong, Bisheng Yang, **Yuan Liu**, Fuxun Liang, Yongjun Wang.

ISPRS Journal of Photogrammetry and Remote Sensing 2017.

- Using mobile laser scanning data for features extraction of high accuracy driving maps.
Bisheng Yang, **Yuan Liu**, Fuxun Liang, Zhen Dong.
ISPRS Annals 2016
- Automatic registration of large-scale urban scene point clouds based on semantic feature points.
Bisheng Yang, Zhen Dong, Fuxun Liang, **Yuan Liu**.
ISPRS Journal of Photogrammetry and Remote Sensing 2016.

Rewards

- ◆ National Postgraduate Scholarship in 2017 (for top 5% students)
- ◆ National Undergraduate Scholarship in 2013 (for top 5% students)

Skills

Programming Languages/Frameworks

- ◆ C/C++, C#, Python, MATLAB
- ◆ TensorFlow, Pytorch, CUDA

Relative Basics

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