YUJING LOU

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EDUCATION

Shanghai Jiao Tong University *Shanghai, China*

M.S. in **Computer Science and Technology** Sep. 2018 – Mar. 2021

GPA: 3.74/4.0

Harbin Institute of Technology *Harbin, China*

B.Eng. (Honors School of HIT) in **Computer Science and Technology** with Honor Sep. 2014 – Jun. 2018

GPA: 91.19/100.00. Ranking 3/24 in Computer Science honor class.

CORE COURSES

SJTU: Computer Graphics (A), Natural Language Understanding (A), Brain like Intelligence (A), Digital Image Processing (A), Intelligent Perception and Mobile Computing (A-), Neural Network Principles (A-)

HIT: Linear Algebra and Analytic Geometry (94), Set Theory and Graph Theory (99), Probability Theory and Mathematical (93.5), The Design and Analysis of Algorithms (90.6), An Introduction to Machine Learning (96), Pattern Recognition (98.6), Formal Languages and Automata (96), Database Systems (95.9), Operations Research and Optimization (97), Computer Vision (92)

RESEARCH INTEREST

I am interested in 3D scene/object understanding. My research experiences focus on the algorithms and applications of deep learning and 3D vision, especially on facilitating semantic understanding of 3D scene by finding implicit correspondences between models which will help interacting with environment in the future work.

PUBLICATIONS

KeypointNet: A Large-scale 3D Keypoint Dataset Aggregated from Numerous Human Annotations

Anonymous Submission

Submitted to Conference on Computer Vision and Pattern Recognition, **CVPR 2020**

Fine-grained Object Semantic Understanding from Correspondences

Yujing Lou*, Yang You*, Chengkun Li*, Zhoujun Cheng, Liangwei Li, Lizhuang Ma, Weiming Wang, Cewu Lu (*Equal Contribution)*

Preprint, **arXiv 2020**

Area: Object Matching, Semantic Understanding, 3D Computer Vision

PRIN: Pointwise Rotation-Invariant Network

Yujing Lou*, Yang You*, Qi Liu, Yu-Wing Tai, Lizhuang Ma, Cewu Lu, Weiming Wang (*Equal Contribution)*

Thirty-Fourth AAAI Conference on Artificial Intelligence, **AAAI 2020**

Area: 3D Computer Vision, Object Recognition

RESEARCH EXPERIENCE

Finding Fine-grained Correspondences among Daily Objects *SJTU*

ADVISOR: **Cewu Lu** *Mar. 2019 – Nov. 2019*

- Propose an idea that different objects in one category have implicit correspondences with fine-grained connections.
- Build a dataset that includes correspondences of different objects in one category with different people's understanding.
- Analyze the cognition of correspondences among different people and infer that there exists rational semantic connection between specific areas.
- Use point cloud processing algorithms (like PointConv, PointNet++) to encode the objects getting embeddings.
- Propose the push-pull loss to pull the embeddings that conform common sense together and push the embeddings that have big divergences, which make sure that the areas having similar semantic knowledge are encoded with same embeddings.
- Submitted to CVPR 2020.

Rotation-invariance of Objects in 3D Deep Learning *SJTU*

ADVISOR: **Cewu Lu** *Oct. 2017 – Nov. 2018*

- Find that point cloud analysis without pose priors is difficult in real application, as the orientation of point clouds are often unknown. One way to conquer this challenge is to find the rotation-invariant feature of point cloud.
- Use density-aware adaptive sampling module to build spherical signals and solve the distorted distribution problem.
- Exploit Spherical Voxel Convolution to extract rotation-invariant features of point cloud in the spherical space.
- For part segmentation and classification task, trained on dataset of objects with canonical pose, our method achieves SOTA results on arbitrary rotated shapes. Most 3D deep learning network fails on this task and rotation-invariant geometric descriptors can not attain comparable results.
- Accepted by AAAI 2020.

Building an Intra-building Navigation and Device for Blind People *NUS*

ADVISOR: **SOO Yuen Jien** *Jun. 2017 – Jul. 2018*

- Design an intra-building navigation algorithm to find the shortest route and use hardware platform to build a little car which can guide blind people and help them avoid obstacles.
- Build a little car by using Raspberry Pi as central processing unit which can control the movement, catch the building map from internet, design the route and output the commands for guiding.
- Use Arduino to acquire the signal from compass, ultrasonic sensor and camera and communicate with Raspberry Pi.
- Implement a control algorithm according to PID control theory to control the car go straight robust to disturbance.

HONORS AND AWARDS

- SZSE scholarship *2019*
- Top 10 Graduates of Honors School (10 in 230) *2018*
- National Scholarship (Top 0.2% in China) *2017*
- Samsung Scholarship *2016*
- Selected Member of HIT Elite Program in Computer Science (Honors School of HIT) *2015*

SKILLS

Programming Languages Python (Pytorch, Tensorflow), C/C++, Matlab, Java, HTML, Verilog (FPGA on Xilinx boards)

Design Tools Adobe Photoshop, Adobe Illustrator