RAN YI

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EDUCATION

Tsinghua University Beijing, China 09/2016 – Present
Ph.D. candidate in Computer Science and Technology
Research Interests: Computer vision and computational geometry

Tsinghua University Beijing, China 09/2012 – 07/2016
B.E. in Electronic Information Science and Technology
Ranking: 5/237 Average Score: 94/100

The University of Melbourne Melbourne, Australia 03/2015 – 06/2015
Exchange Program (Undergraduate)

PROJECT EXPERIENCE

I. Computer vision and machine learning

Artistic Portrait Drawing Generation from Face Photos **07/2018–04/2019**

- Proposed a novel GAN based model that builds upon hierarchical generators and discriminators and a novel DT loss to promote line-stroke based style.
- Proposed an enhanced model that achieves better APDrawings with improved facial features.
- Conducted experiments on a newly constructed APDrawing Dataset, our proposed method outperforms state-of-the-art in qualitative evaluation and human perceptual study.
- A web demo of proposed method: https://face.lol
- A wechat program is available by scanning the code:

Weakly-Supervised Crop Lesion Region Segmentation **01/2019–03/2019**

- Proposed a coarse-to-fine strategy for crop lesion region segmentation which only requires weak supervision of image-level labels.
- Conducted experiments on PlantVillage dataset, our method achieves better segmentation results than state-of-the-art methods.

An Adaptive Filter for Deep Learning Networks on Large-Scale Point Cloud **11/2018-02/2019**

- Proposed an efficient filter to filter large-scale point cloud into representative points to lower computational cost of current networks for point cloud analysis.
- Conducted experiments on PointNet and PointNet++, our filter greatly lowers computational cost and improves accuracy on ScanNet dataset.

Feature-Aware Content-Sensitive Supervoxel Segmentation **12/2018–03/2019**

- Proposed a Feature-aware CSS algorithm that has explicit control of generating points positions and outputs a segmentation whose cell boundaries well align with local video boundaries.
- Conducted experiments on four datasets and two applications to show Feature-aware CSS outperforms existing methods.

Content-Sensitive Supervoxel Segmentation **07/2017–11/2017**

- Proposed a CSS algorithm based on video manifold tessellation and proved to have approximation guarantees.
- Conducted experiments on four datasets to show CSS outperforms existing methods.

Machine Reading Comprehension **05/2017–06/2017**

- Proposed a seven-layer SSAE model based on Bi-LSTM, attention flow and syntactic dependency tree.
- Conducted experiments on SQuAD dataset and showed SSAE ranks 5th on leaderboard (June 2017).

II. Computational geometry and computer graphics

Constructing Delaunay Mesh with Lower Dirichlet Energy **07/2018–10/2018**

- Proposed a construction method of a special Delaunay Mesh, whose Dirichlet energy is guaranteed to be smaller than intrinsic Delaunay triangulation.
- Applied the proposed method to texture mapping and showed our method achieves better texture mapping with fewer visual artifacts than IDT and DM.

Optimal Delaunay Mesh Simplification **03/2018–06/2018**

- Proposed a novel differential-evolution-based model to compute a low-cost path in the Delaunay Mesh simplification solution space, which leads to high-quality Delaunay Mesh.
- Conducted experiments on a large number of models and our method consistently outperforms the existing methods in terms of approximation error, and achieves much better results on CAD models with sharp features.

Globally Optimal Geodesic Centroidal Voronoi Tessellations **11/2015–05/2016**

- Proposed a Manifold DE algorithm which extends differential evolution framework to manifold domains and achieves global optimum.
- Conducted experiments on a wide range of 3D models to show MDE outperforms existing methods.

III. Robotic planning and applications

Multiple Robotic Arm Collision Detection **03/2019–Present**

- Proposed a deep-learning based method to detect robotic arm collision with environment and between robotic arms.
- Utilized relations between joints to increase detection accuracy and reduce configuration space.
- Conducted experiments in both synthetic and real-world scenes and showed proposed method outperforms existing methods in detection accuracy.

Auto Scanning and Reconstruction of Indoor Scenes **03/2019–Present**

- Proposed a method for autonomous 3D scanning and reconstruction of indoor scenes based on next best object and next best view planning.
- Conducted experiments in indoor scenes and showed proposed method achieves efficient reconstruction.

Delta DLP 3D Printing with Large Size **01/2016–11/2016**

- Proposed a system to enable large object DLP 3D printing by horizontal movement of platform.
- Proposed an algorithm for object partition and path planning for more efficient printing.
- Conducted experiments and showed models fabricated by our system have similar stiffness as models printed by traditional DLP 3D printer.

PUBLICATIONS

[1] **Ran Yi**, Yong-Jin Liu, Yu-Kun Lai, Paul L. Rosin. **APDrawingGAN: Generating Artistic Portrait Drawings from Face Photos with Hierarchical GANs**. IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2019), pages 10743-10752, 2019. Oral paper.

[2] Zipeng Ye*, **Ran Yi***, Minjing Yu, Yong-Jin Liu, Ying He. Fast Computation of Content-Sensitive Superpixels and Supervoxels using q-distances. IEEE Conference on Computer Vision (ICCV 2019), accepted, 2019.

[3] Wang Zhao*, **Ran Yi***, Yong-Jin Liu. An Adaptive Filter for Deep Learning Networks on Large-Scale Point Cloud. IEEE International Conference on Image Processing (ICIP 2019), accepted, 2019.

[4] Wenyong Gong, **Ran Yi**, Yong-Jin Liu, Ying He. Constructing Delaunay Mesh with Lower Dirichlet Energy than Intrinsic Delaunay Triangulation. Communications in Information and Systems, accepted, 2019.

[5] **Ran Yi**, Yong-Jin Liu, Ying He. **Delaunay Mesh Simplification with Differential Evolution**. ACM Transactions on Graphics (SIGGRAPH ASIA 2018), Vol. 37, No. 6, Article No. 263, 2018.

[6] **Ran Yi**, Yong-Jin Liu, Yu-Kun Lai. **Content-Sensitive Supervoxels via Uniform Tessellations on Video Manifolds**. IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2018), pages 645-655, 2018.

[7] **Ran Yi***, Chenming Wu*, Yong-Jin Liu, Ying He, Charlie C. L. Wang. **Delta DLP 3D Printing of Large Model**. IEEE Transactions on Automation Science and Engineering (TASE), Vol. 15, No. 3, pp. 1193-1204, 2018.

[8] **Ran Yi**, Yong-Jin Liu, Yu-Kun Lai. **Evaluation on the Compactness of Supervoxels**. IEEE International Conference on Image Processing (ICIP 2018), pp. 2212-2216, 2018.

[9] Yong-Jin Liu, Chun-Xu Xu, **Ran Yi**, Dian Fan, Ying He. **Manifold Differential Evolution (MDE): A Global Optimization Method for Geodesic Centroidal Voronoi Tessellations on Meshes**. ACM Transactions on Graphics (SIGGRAPH ASIA 2016), Vol. 35, No. 6, Article No. 243, 2016.

[10] Chenming Wu*, **Ran Yi***, Yong-Jin Liu, Ying He, Charlie C.L. Wang. **Delta DLP 3D Printing with Large Size**. The 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016), pp. 2155-2160, 2016.

* Equal contribution

HONORS AND AWARDS

National Graduate Student Scholarship	10/2018
CCF-CV Award (nomination)	10/2018
Beijing Outstanding Graduates (undergraduate)	07/2016
Excellent Graduates of Tsinghua University (undergraduate)	07/2016
Excellent Academic Performance Single Scholarship	10/2015

SKILLS AND OTHERS

Programming languages: C++, Python, MATLAB
Deep learning framework: Tensorflow, Pytorch, Caffe