RAN YI

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EDUCATION

Tsinghua University Beijing, China 09/2016 – 06/2021
Ph.D. candidate in Computer Science and Technology
Research Interests: Computer vision and computational graphics

Tsinghua University Beijing, China 09/2012 – 06/2016
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

Unpaired Portrait Drawing Generation via Asymmetric Cycle Mapping (CVPR 2020) 06/2019–11/2019

- Proposed an asymmetric cycle mapping model to learn portrait generation from unpaired data, in order to solve the missing facial feature problem of current methods.
- Incorporated style code as input to generate portrait drawings of multiple styles.
- Conducted experiments on multiple datasets, our method outperforms state-of-the-art methods in generation quality and human perceptual study.

Audio-driven Talking Face Video Generation 08/2019–11/2019

- Proposed a novel framework that given an audio and a short video of a target person, produces a personalized high-quality realistic talking face video with head movements.
- Utilized 3D face geometry and GAN-based rendering to synthesize videos with natural head movements.
- Conducted experiments on LRW dataset and web videos, our method achieves better results than state-of-the-art methods with natural head movements.

Artistic Portrait Drawing Generation from Face Photos (CVPR 2019) 07/2018–11/2018

- Proposed a novel GAN based model that builds upon hierarchical generators and discriminators and a novel DT loss to promote line-stroke based style.
- Conducted experiments on a newly constructed APDrawing Dataset, our proposed method outperforms state-of-the-art in qualitative evaluation and human perceptual study.
- Developed a wechat program “AI portrait master” and has been visited over 38k times in two weeks.

Feature-Aware Content-Sensitive Supervoxel Segmentation (TPAMI) 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 (CVPR 2018, ICCV 2019) 07/2017–11/2017, 09/2018-12/2018

- Proposed a supervoxel algorithm based on video manifold tessellation and proved to have approximation guarantees.
- Proposed a fast supervoxel and superpixel segmentation method based on q-distances.
- Conducted experiments on four datasets to show the proposed method outperforms existing methods.

An Adaptive Filter for Deep Learning Networks on Large-Scale Point Cloud (ICIP 2019) 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.

II. Computational geometry and computer graphics

Constructing Delaunay Mesh with Lower Dirichlet Energy (CIS) **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 (SIGGRAPH Asia 2018) **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 (SIGGRAPH Asia 2016) **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

A Configuration-Space Decomposition Scheme for Learning-based Collision Checking **04/2019–09/2019**

- Proposed a novel configuration space decomposition method and build a composite classifier for collision checking.
- Conducted experiments and showed the composite classifier's effectiveness in a multi-robot system with three UR5 robotic arms.

Delta DLP 3D Printing with Large Size (TASE, IROS 2016) **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

7 papers in CVPR / ICCV / TPAMI / TOG (SIGGRAPH Asia)

[1] **Ran Yi**, Yong-Jin Liu, Yu-Kun Lai, Paul L. Rosin. **Unpaired Portrait Drawing Generation via Asymmetric Cycle Mapping**. IEEE Conference on Computer Vision and Pattern Recognition (**CVPR 2020**), accepted, 2020.

[2] **Ran Yi,** Zipeng Ye, Wang Zhao, Minjing Yu, Yu-Kun Lai, Yong-Jin Liu. **Feature-Aware Uniform Tessellations on Video Manifold for Content-Sensitive Supervoxels**. IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), DOI 10.1109/TPAMI.2020.2979714, 2020.

[3] **Ran Yi**, Zipeng Ye, Juyong Zhang, Hujun Bao, Yong-Jin Liu. **Audio-driven Talking Face Video Generation with Learning-based Personalized Head Pose**. CoRR, vol. abs/2002.10137, 2020.

[4] **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.

[5] 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**), pages 3770-3779, 2019.

[6] 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), pages 1620-1624, 2019.

[7] 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 (CIS), Vol. 3, 2019.

[8] **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.

[9] **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.

[10] **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.

[11] **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.

[12] 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.

[13] 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

CCF-CV Award (3 students each year)	11/2019
MSRA Fellowship Nomination	11/2019
National Graduate Student Scholarship	11/2019
National Graduate Student Scholarship	11/2018
CCF-CV Award (nomination)	11/2018
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: Pytorch, Tensorflow, Caffe