Li Yi

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ACADEMIC EMPLOYMENT

Tsinghua University, Institute for Interdisciplinary Information Sciences **Beijing, China**

6/2021-present Assistant Professor

Research Focus: 3D computer vision, 3D deep learning, embodied AI, geometric computation

EDUCATION

9/2013-9/2019 **Stanford University** **CA, US**

- Ph.D. in Electrical Engineering;
- Advisor: Leonidas J. Guibas

9/2009-7/2013 **Tsinghua University (THU)** **Beijing, China**

- B.E. in Electronic Engineering;
- Advisor: Jiangtao (Gene) Wen

PUBLICATIONS

All Peer-Reviewed Publications

1. Xiaomeng Xu*, Yun Liu*, Weihang Chen, Haocheng Yuan, He Wang, Jing Xu, Rui Chen, **Li Yi**†. Enhancing Generalizable 6D Pose Tracking of an In-Hand Object with Tactile Sensing. RAL 2023.
2. Liuyu Bian, Pengyang Shi, Weihang Chen, Jing Xu, **Li Yi**†, Rui Chen†. TransTouch: Learning Transparent Objects Depth Sensing Through Sparse Touches. IROS 2023.
3. Yunze Liu, Junyu Chen, Zekai Zhang, **Li Yi**†. LeaF: Learning Frames for 4D Point Cloud Sequence Understanding. ICCV 2023.
4. Xueyi Liu, Bin Wang, He Wang, **Li Yi**†. Few-Shot Physically-Aware Articulated Mesh Generation via Hierarchical Deformation. ICCV 2023.
5. Weikang Wan*, Haoran Geng*, Yun Liu, Zikang Shan, Yaodong Yang, **Li Yi**, He Wang. UniDexGrasp++: Improving Dexterous Grasping Policy Learning via Geometry-aware Curriculum and Iterative Generalist-Specialist Learning. ICCV 2023.
6. Chengliang Zhong, Yuhang Zheng, Yupeng Zheng, Hao Zhao, **Li Yi**, Xiaodong Mu, Ling Wang, Pengfei Li, Guyue Zhou, Chao Yang, Xinliang Zhang, Jian Zhao. 3D Implicit Transporter for Temporally Consistent Keypoint Discovery. ICCV 2023
7. Jingwei Huang, Shanshan Zhang, Bo Duan, Yanfeng Zhang, Xiaoyang Guo, Mingwei Sun, **Li Yi**. ArrangementNet: Learning Scene Arrangements for Vectorized Indoor Scene Modeling. SIGGRAPH 2023.
8. Zekun Qi*, Runpei Dong*, Guofan Fan, Zheng Ge, Xiangyu Zhang, Kaisheng Ma†, **Li Yi**†. Contrast with Reconstruct: Contrastive 3D Representation Learning Guided by Generative Pretraining. ICML 2023.
9. Zhuoyang Zhang*, Yuhao Dong*, Yunze Liu, **Li Yi**. Complete-to-Partial 4D Distillation for Self-Supervised Point Cloud Sequence Representation Learning. CVPR 2023.
10. Juntian Zheng*, Lixing Fang*, Qingyuan Zheng*, Yun Liu, **Li Yi**. CAMS: CAnonicalized Manipulation Spaces for Category-Level Functional Hand-Object Manipulation Synthesis. CVPR 2023.
11. Xiaomeng Xu, Yanchao Yang, Kaichun Mo, Boxiao Pan, **Li Yi**, Leonidas J. Guibas. JacobiNeRF: NeRF Shaping with Mutual Information Gradients. CVPR 2023.
12. Haoran Geng*, Helin Xu*, Chengyang Zhao*, Chao Xu, **Li Yi**, Siyuan Huang, He Wang. GAPartNet: Learning Generalizable and Actionable Parts for Cross-Category Object Perception and Manipulation. CVPR 2023.
13. Yinzhen Xu*, Weikang Wan*, Jialiang Zhang*, Haoran Liu*, Zikang Shan, Hao Shen, Ruicheng Wang, Haoran Geng, Yijia Weng, Jiayi Chen, Tengyu Liu, **Li Yi**, He Wang. UniDexGrasp: Universal Robotic Dexterous Grasping via Learning Diverse Proposal Generation and Goal-Conditioned Policy. CVPR 2023

14. Xuanyao Chen*, Zhijian Liu*, Haotian Tang, **Li Yi**, Hang Zhao, Song Han. SparseViT: Revisiting Activation Sparsity for Efficient High-Resolution Vision Transformer. CVPR 2023.
15. Gengxin Liu, Qian Sun, Haibin Huang, Chongyang Ma, Yulan Guo, **Li Yi**, Hui Huang, Ruizhen Hu. Semi-Weakly Supervised Object Kinematic Motion Prediction. CVPR 2023.
16. Xueyi Liu, Ji Zhang, Ruizhen Hu, Haibin Huang, He Wang, **Li Yi**. Self-Supervised Category-Level Articulated Object Pose Estimation with Part-Level SE(3) Equivariance. ICLR 2023
17. Runpei Dong, Zekun Qi, Linfeng Zhang, Junbo Zhang, Jianjian Sun, Zheng Ge, **Li Yi†**, Kaisheng Ma†. Autoencoders as Cross-Modal Teachers: Can Pretrained 2D Image Transformers Help 3D Representation Learning? ICLR 2023.
18. Junbo Zhang, Guofan Fan, Guanghan Wang, Zhengyuan Su, Kaisheng Ma, **Li Yi**. Language-Assisted 3D Feature Learning for Semantic Scene Understanding. AAAI 2023.
19. Jiayi Chen, Mi Yan, Jiazhao Zhang, Yinzhen Xu, Xiaolong Li, Yijia Weng, **Li Yi**, Shuran Song, He Wang. Tracking and Reconstructing Hand Object Interactions from Point Cloud Sequences in the Wild. AAAI 2023.
20. Zhan Xu, Yang Zhou, **Li Yi**, Evangelos Kalogerakis. MoRig: Motion-Aware Rigging of Character Meshes from Point Clouds. SIGGRAPH Asia 2022
21. Hao Wen, Yunze Liu, Jingwei Huang, Bo Duan, **Li Yi**. Point Primitive Transformer for Long-Term 4D Point Cloud Video Understanding. ECCV 2022.
22. Yunze Liu, Yun Liu, Che Jiang, Zhoujie Fu, Kangbo Lyu, Weikang Wan, Hao Shen, Boqiang Liang, He Wang, **Li Yi**. HOI4D: A 4D Egocentric Dataset for Category-Level Human-Object Interaction. CVPR 2022
23. Hong-Xing Yu, Jiajun Wu, **Li Yi.** Rotationally Equivariant 3d Object Detection. CVPR 2022
24. Tianchen Zhao, Niansong Zhang, Xuefei Ning, He Wang, **Li Yi†**, Yu Wang. CodedVTR: Codebook-Based Sparse Voxel Transformer with Geometric Guidance. CVPR 2022
25. Xueyi Liu, Xiaomeng Xu, Anyi Rao, Chuang Gan, **Li Yi**. AutoGPart: Intermediate Supervision Search for Generalizable 3D Part Segmentation. CVPR 2022
26. Yining Hong, Kaichun Mo, **Li Yi**, Leonidas Guibas, Antonio Torralba, Joshua Tenenbaum, Chuang Gan. Fixing Malfunctional Objects With Learned Physical Simulation and Functional Prediction. CVPR 2022
27. Zhan Xu, Matthew Fisher, Yang Zhou, Deepali Aneja, Rushikesh Dudhat, **Li Yi**, Evangelos Kalogerakis. APES: Articulated Part Extraction from Sprite Sheets. CVPR 2022
28. Kai Ye, Siyan Dong, Qingnan Fan, He Wang, **Li Yi**, Fei Xia, Jue Wang, Baoquan Chen. Multi-Robot Active Mapping via Neural Bipartite Graph Matching. CVPR 2022
29. Yining Hong, **Li Yi**, Joshua B. Tenenbaum, Antonio Torralba, Chuang Gan. PTR: A Benchmark for Part-based Conceptual, Relational, and Physical Reasoning. NeurIPS 2021
30. Xiaolong Li, Yijia Weng, **Li Yi**, Leonidas J. Guibas, A. Lynn Abbott, Shuran Song, He Wang. Leveraging SE(3) Equivariance for Self-supervised Category-Level Object Pose Estimation from Point Clouds. NeurIPS 2021
31. Yunze Liu, Qingnan Fan, Shanghang Zhang, Hao Dong, Thomas Funkhouser, **Li Yi**. Contrastive Multimodal Fusion with TupleInfoNCE. ICCV 2021
32. **Li Yi**, Boqing Gong, Thomas Funkhouser. Complete&Label: A Domain Adaptation Approach to Semantic Segmentation of LiDAR Point Clouds. CVPR 2021
33. Siyan Dong*, Qingnan Fan*, He Wang, Ji Shi, **Li Yi**, Thomas Funkhouser, Baoquan Chen, Leonidas J. Guibas. Robust Neural Routing Through Space Partitions for Camera Relocalization in Dynamic Indoor Environments. CVPR 2021
34. Yueqi Duan, Haidong Zhu, He Wang, **Li Yi**, Ram Nevatia, Leonidas J. Guibas. Curriculum DeepSDF. ECCV 2020.
35. Fanbo Xiang, Yuzhe Qin, Kaichun Mo, Yikuan Xia, Hao Zhu, Fangchen Liu, Minghua Liu, Hanxiao Jiang, Yifu Yuan, He Wang, **Li Yi**, Angel X.Chang, Leonidas J. Guibas, Hao Su. SAPIEN: A SimulAted Part-based Interactive ENvironment. CVPR 2020.
36. Kaichun Mo, Paul Guerrero, **Li Yi**, Hao Su, Peter Wonka, Niloy Mitra, Leonidas J. Guibas. StructEdit: Learning Structural Shape Variations. CVPR 2020.

37. Xiaolong Li, He Wang, **Li Yi**, Leonidas Guibas, A. Lynn Abbott, Shuran Song. Category-Level Articulated Object Pose Estimation. CVPR 2020.
38. Chenyang Zhu, Kai Xu, Siddhartha Chaudhuri, **Li Yi**, Leonidas J. Guibas, and Hao Zhang. AdaCoSeg: Adaptive Shape Co-Segmentation with Group Consistency Loss. CVPR 2020.
39. Kaichun Mo, Paul Guerrero, **Li Yi**, Hao Su, Peter Wonka, Niloy Mitra, Leonidas J. Guibas. StructureNet: Hierarchical Graph Networks for 3D Shape Generation. SIGGRAPH Asia 2019
40. **Li Yi**, Wang Zhao, He Wang, Minhyuk Sung, Leonidas J Guibas. GSPN: Generative shape proposal network for 3d instance segmentation in point cloud. CVPR 2019
41. Kaichun Mo, Shilin Zhu, Angel X.Chang, **Li Yi**, Subarna Tripathi, Leonidas J. Guibas and Hao Su. PartNet: A Large-scale Benchmark for Fine-grained and Hierarchical Part-level 3D Object Understanding. CVPR 2019.
42. Jingwei Huang, Haotian Zhang, **Li Yi**, Thomas Funkhouser, Matthias Niessner, Leonidas Guibas. TextureNet: Consistent Local Parametrizations for Learning from High-Resolution Signals on Meshes. CVPR 2019.
43. Lingxiao Li*, Minhyuk Sung*, Anastasia Dubrovina, **Li Yi**, Leonidas Guibas. Supervised Fitting of Geometric Primitives to 3D Point Clouds. CVPR 2019.
44. Tong He, Haibin Huang, **Li Yi**, Yuqian Zhou, Qihao Wu, Jue Wang, Stefano Soatto. GeoNet: Deep Geodesic Networks for Point Cloud Analysis. CVPR 2019.
45. **Li Yi**, Haibin Huang, Difan Liu, Evangelos Kalogerakis, Hao Su, Leonidas Guibas. Deep Part Induction from Articulated Object Pairs. SIGGRAPH Asia 2018.
46. Cewu Lu, Hao Su, Yonglu Li, Yongyi Lu, **Li Yi**, Chi-Keung Tang, Leonidas Guias. Beyond Holistic Object Recognition: Enriching Image Understanding with Part States. CVPR 2018.
47. Charles Qi, **Li Yi**, Hao Su, Leonidas Guibas. PointNet++: Deep Hierarchical Feature Learning on Point Sets in a Metric Space. NeurIPS 2017.
48. **Li Yi**, Ersin Yumer, Vladimir Kim, Aaron Hertzmann, Hao Su, Leonidas Guibas. Learning Hierarchical Shape Segmentation and Labeling from Online Repositories. SIGGRAPH 2017.
49. **Li Yi**, Hao Su, Xingwen Guo, Leonidas Guibas. SyncSpecCNN: Synchronized Spectral CNN for 3D Shape Segmentation. CVPR 2017 (spotlight).
50. **Li Yi**, Vladimir Kim, Duygu Ceylan, I-Chao Shen, Mengyuan Yan, Hao Su, Cewu Lu, Qixing Huang, Alla Sheffer, Leonidas J. Guibas. A Scalable Active Framework for Accurately Labeling 3D Shape Collections. SIGGRAPH Asia 2016.
51. Hao Su, Fan Wang, **Li Yi**, Leonidas J. Guibas. 3D-Assisted Image Feature Synthesis for Novel Views of an Object. ICCV 2015 (oral).
52. Qiang Ning, Kan Chen, **Li Yi**, Chuchu Fan, Yao Lu and Jiangtao Wen, Fellow, IEEE. Image Super-Resolution via Analysis Sparse Prior. IEEE Signal Processing Letters 2013.

Technical Reports

1. Yunze Liu, Changxi Chen, **Li Yi**†. Interactive Humanoid: Online Full-Body Motion Reaction Synthesis with Social Affordance Canonicalization and Forecasting. arXiv:2312.08983 [cs.CV], 2023.
2. Runpei Dong, Chunrui Han, Yuang Peng, Zekun Qi, Zheng Ge, Jinrong Yang, Liang Zhao, Jianjian Sun, Hongyu Zhou, Haoran Wei, Xiangwen Kong, Xiangyu Zhang, Kaisheng Ma†, **Li Yi**†. DreamLLM: Synergistic Multimodal Comprehension and Creation. arXiv:2309.11499 [cs.CV], 2023.
3. Yuhao Dong*, Zhuoyang Zhang*, Yunze Liu, **Li Yi**†. NSM4D: Neural Scene Model Based Online 4D Point Cloud Sequence Understanding. arXiv:2310.08326 [cs.CV], 2023.

4. Yunze Liu*, **Li Yi***, Shanghang Zhang, Qingnan Fan, Thomas Funkhouser, Hao Dong. P4Contrast: Contrastive Learning with Pairs of Point-Pixel Pairs for RGB-D Scene Understanding. arXiv:2012.13089 [cs.CV], 2020.
5. Songfang Han, Jiayuan Gu, Kaichun Mo, **Li Yi**, Siyu Hu, Xuejin Chen and Hao Su. Compositionally Generalizable 3D Structure Prediction.arXiv:2012.02493[cs.CV], 2020.
6. He Wang*, Zetian Jiang*, **Li Yi**, Kaichun Mo, Hao Su, Leonidas J. Guibas. Rethinking Sampling in 3D Point Cloud Generative Adversarial Networks. arXiv:2006.07029 [cs.CV], 2020.
7. **Li Yi**, Hao Su, Lin Shao, Manolis Savva and others. Large-Scale 3D Shape Reconstruction and Segmentation from ShapeNet Core55. arXiv:1710.06104 [cs.CV], 2017.
8. Angel X. Chang, Thomas Funkhouser, Leonidas Guibas, Pat Hanrahan, Qixing Huang, Zimo Li, Silvio Savarese, Manolis Savva, Shuran Song, Hao Su, Jianxiong Xiao, **Li Yi**, and Fisher Yu. ShapeNet: An Information-Rich 3D Model Repository. arXiv:1512.03012, 2015.

Dissertations

· **Li Yi**. Deep Object-Centric 3D Perception. Ph.D. Thesis, Stanford University, 2019.

PATENTS

· Vladimir Kim, Aaron Hertzmann, Mehmet Yumer, **Li Yi**. Segmenting three-dimensional shapes into labeled component shapes. US Patent App. 15/440,572, issued Aug. 23, 2018

ACADEMIC SERVICES

Workshop Organizer	· CVPR 2023 Workshop 4D Hand Object Interaction: Geometric Understanding and Applications in Dexterous Manipulation
	· ICCV 2021 Workshop: SEAI: Simulation Technology for Embodied AI
	· ECCV 2018 Workshop: Visual Learning and Embodied Agents in Simulation Environments
	· ShapeNet Challenge 2018: Large-scale 3D Shape Reconstruction and Segmentation from ShapeNet Core 55
Area Chair	· Conference on Neural Information Processing Systems 2023 (NeurIPS 2023)
	· IEEE Conference on Computer Vision and Pattern Recognition 2023 (CVPR 2023)
	· The 32nd International Joint Conference on Artificial Intelligence (IJCAI 2023)
	· IEEE Conference on Computer Vision and Pattern Recognition 2022 (CVPR 2022)
	· IEEE/CVF Winter Conference on Applications of Computer Vision 2023 (WACV 2023)
Conference Reviewer	· IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
	· International Conference on Computer Vision (ICCV)
	· European Conference on Computer Vision (ECCV)
	· International Conference on 3D Vision (3DV)
	· SIGGRAPH
	· SIGGRAPH Asia
	· Eurographics
	· Pacific Graphics
	· AAAI Conference on Artifitial Intelligence
	· Conference on Neural Information Processing Systems (NeurIPS)
	· International Conference on Machine Learning (ICML)
Journal Reviewer	· International Journal of Computer Vision (IJCV)
	· IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)
	· IEEE Transactions on Visualization and Computer Graphics (TVCG)
	· Computer Graphics Forum (CGF)

TEACHING

Autumn 2023	Instructor, Tsinghua University, Advanced Computer Graphics
Spring 2023	Instructor, Tsinghua University, 3D Visual Computing
Autumn 2022	Instructor, Tsinghua University, Advanced Computer Graphics
Spring 2022	Instructor, Tsinghua University, 3D Visual Computing
Autumn 2020	Guest Lecturer, Stanford University, Computer Graphics in the Era of AI (CS348I)

Spring 2018 Guest Lecturer, Stanford University, Geometric and Topological Data Analysis (CS 233)
Spring 2017 Guest Lecturer, Stanford University, Machine Learning for 3D Data (CS 468)

HONORS AND AWARDS

- Hong Seh and Vivian W. M. Lim Fellowship (Stanford University, 2013-2014)
- Excellent Undergraduate Award, awarded to the top 2% students(Tsinghua University, 2013)
- Nanxiang Jiang Fellowship, awarded to the top 0.3% students (Tsinghua University, 2012)
- Microchip Technology Scholarship (Microchip Technology Inc, 2012)
- The Samsung Scholarship, awarded to the top 5% students (Tsinghua University, 2011)
- San Chang Scholarship, awarded to the top 10% students (Tsinghua University, 2010)

EMPLOYMENT HISTORY

Google Research, Perception **CA, US**
10/2019-5/2021 Research Scientist
Manager: Dr. Thomas Funkhouser
Focus: Research on 3D scene understanding, 3D deep learning, shape analysis

Stanford University, Geometric Computing Lab **CA, US**
9/2013-9/2019 Research Assistant, advised by Leonidas J. Guibas
- 3D Knowledge Base Construction
- 3D Deep Learning
- Object Functionality Understanding via Part Analysis

Baidu Research USA **CA, US**
7/2017-9/2017 Research Intern, advised by Yi Yang, Wei Xu
- Discovering Landmarks to Construct Topological Map for Indoor Navigation

Adobe Systems Incorporated, Emerging Graphics Group **CA, US**
6/2016-9/2016 Research Intern, advised by Ersin Yumer
- Hierarchical Shape Structure and Labeling from Scene Graphs in the Wild

6/2015-9/2015 Research Intern, advised by Duygu Ceylan
- Establishing Image Correspondences Across a Large Image Collection

University of Southern California, Computer Vision Laboratory **CA, US**
6/2012-10/2012 Research Intern, advised by Gerard Medioni
- Probabilistic Tensor Voting

Megvii Inc., Face++ Group **Beijing, China**
9/2012-2/2013 Research Intern, advised by Hao Li
Face Clone