JIANG CHENHAN

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Research Interests: 3D Generation | 3D Scene Understanding | Representation Learning

EDUCATION

PhD. in Computer Science and Engineering
Hong Kong University of Science and Technology   📅 Sep. 2022 – Ongoing
- Supervisor: Dit-Yan Yueng.
- Research topics are 3D generation and perception, including text-to-3D generation, scene understanding.

M.S. in Computer Science and Technology
Sun Yat-san University   📅 Sep. 2016 – Jun. 2019
- Supervisor: Lin Liang. Co-supervisor: Liang Xiaodan.
- Research topics is large-scale 2D detection.

B.S. in Intelligent Science and Technology
XiDian University   📅 Sep. 2012 – Jun. 2016
- GPA: 3.7/4.0 (ranked: 15/130). Relevant courses: Machine Learning, Digital Image Process, Data Structure, etc.

WORK EXPERIENCE

Noah Ark's Lab, Huawei Co., Ltd | Researcher   📅 Aug. 2019 – Jun. 2022
Work for Autonomous Driving and Representation Learning. *Supervised by Li Zhenguo*   📍 Hong Kong

SenseTime | Research Intern   📅 Jan. 2018 – Dec. 2018
Focus on Graph-based Large-scale Object Detection. *Supervised by Kuang Zhanghui*   📍 Shenzhen, CN

SELECTED RESEARCH PROJECTS

3D Generation   📅 Feb. 2023 – Ongoing

- To address the multi-Janus problem in the original Score Distillation-based text-to-3D generation, we introduce **joint score distillation (JSD)** on multiple rendered views. We incorporate universal view-aware models to capture interview coherency, indicating compatibility with our JSD. [Submit to CVPR24] *Project link: https://jointdreamer.github.io/*
- Inspired by the pros and cons of learning-based and optimization-based text-to3D generation methods, we propose the 3D Prior-Binding Module, which learns text-3D association from low-shot 3D priors, improving geometric consistency without expensive 3D datasets. Additionally, our 2D Multi-Gradient Optimizer expands training with diverse text prompts, enhancing generation scalability and facilitating fast-forward inference.

3D Representation Learning   📅 Oct. 2020 – Dec. 2022

- We propose a **Contrastive Language-Image-Point cloud Pretraining** framework to facilitate open-vocabulary 3D representation in realistic scenarios. Specifically, we collect text-image-point cloud triplets from real-world autonomous driving scenes and directly align 3D space with broader raw text. [CVPR23]
- To facilitate future research on exploiting unlabeled data for 3D detection, we propose an autonomous driving dataset and build a benchmark to evaluate various self-supervised and semi-supervised methods on it. [NeurIPS21]
- We propose a self-supervised learning approach to alleviate annotation workload in LiDAR-based object detection. Our method addresses inconsistent contrast by introducing voxel distance in feature contrastive learning. We also generate pseudo-instances via motion and utilize self-clustering to learn instance-level representations. [ICCV21]

2D Object Detection   📅 Mar. 2018 – Nov. 2019

- We introduced **SP-NAS**, a two-phase serial-to-parallel architecture search framework, for a flexible task-oriented detection backbone. The Swap-Expand-Reignite phase efficiently prevents redundant ImageNet pretraining via Network Morphism. Then we combine previous sub-architectures to create a stronger parallel-structured backbone. [CVPR20]
- To overcome long-tail data distributions and class ambiguities, we proposed **Reasoning-RCNN** to endow any detectors with the capability of adaptive global reasoning. We build a Global Semantic Pool by collecting the weights of the previous classification layer for each category. Then, we adaptively enhance object features by attending to different semantic contexts in the global semantic pool. [CVPR19]
- To encode high-order object relation in the detection system without any external knowledge, we introduce a **Spatial-aware Graph Relation Network** to discover and incorporate semantic and spatial relationships among objects. [CVPR19]
- We exploit diverse commonsense knowledge to reason large-scale object categories and reach semantic coherency within one image. Specifically, we construct explicit and implicit region-to-region graphs to enhance feature representation. The proposed method achieved improvement on VisualGenome and ADE datasets. [NeurIPS18]

HONORS AND AWARDS

- HKUST RedBird PhD Award   2022
- Huawei PhD Fellowship Award   2022
- Waymo 2D Detection Challenge Top3, Top1   2020/2021
- EuroCity Person Detection Top1   2020
- Huawei Director Award-Outstanding New Employees   2020
- Tianchi Zero-shot Image Classification Competition Top1 [1/3226]   2018
- FashionAI Global Challenge, Tianchi Competition Top2 [2/2323]   2017
- First Class Scholarship, Huawei Scholarship Top 3%   2016/2018

PUBLICATIONS

📄 Journal Articles

- Ding, J., Xie, E., Xu, H., **Jiang, C.**, Li, Z., Luo, P., & Xia, G.-S. (2023). Unsupervised pretraining for object detection by patch reidentification. *IEEE TPAMI*.
- Wang, K., Lin, L., **Jiang, C.**, Qian, C., & Wei, P. (2019). 3d human pose machines with self-supervised learning. *IEEE TPAMI*.

👥 Conference Proceedings

- Chen, R., Mu, Y., Xu, R., Shao, W., **Jiang, Chenhan**, Xu, H., . . . Luo, P. (2023). Co^3: Cooperative unsupervised 3d representation learning for autonomous driving. In *Iclr*.
- Zeng, Y., **Jiang, C***, Mao, J., Han, J., Ye, C., Huang, Q., . . . Xu, H. (2023). Clip^2: Contrastive language-image-point pretraining from real-world point cloud data. In *Cvpr*.
- Du, X., **Jiang C.**, Xu, H., Zhang, G., & Li, Z. (2021). How to save your annotation cost for panoptic segmentation? In *Aaai*.
- Liang*, h., **Jiang***, **C.**, Feng, D., Chen, X., Xu, H., Liang, X., & Li, Z. (2021). Exploring geometry-aware contrast and clustering harmonization for self-supervised 3d object detection. In *Iccv*.
- Mao*, J., Niu*, M., **Jiang, C.**, Liang, H., Liang, X., Li, Y., . . . Yu, J., et al. (2021). One million scenes for autonomous driving: Once dataset. In *Neurips dataset and benchmark*.
- **Jiang***, **C.**, Wang*, S., Xu, H., Liang, X., Lin, L., & Xiao, N. (2020). Elixirnet: Relation-aware network architecture adaptation for medical lesion detection. In *Aaai*.
- **Jiang***, **C.**, Xu*, H., Zhang, W., Liang, X., & Li, Z. (2020). Sp-nas: Serial-to-parallel backbone search for object detection. In *Cvpr*.
- Xu*, H., **Jiang***, **C.**, Liang, X., & Li, Z. (2019). Spatial-aware graph relation network for large-scale object detection. In *Cvpr*.
- Xu*, H., **Jiang***, **C.**, Liang, X., Lin, L., & Li, Z. (2019). Reasoning-rcnn: Unifying adaptive global reasoning into large-scale object detection. In *Cvpr*.
- Yu, W., Liang, X., Gong, K., **Jiang, C.**, Lin, L., & Xiao, N. (2019). Layout-graph reasoning for fashion landmark detection. In *Cvpr*.
- **Jiang***, **C.**, Xu*, H., Liang, X., & Lin, L. (2018). Hybrid knowledge routed modules for large-scale object detection. In *Neurips*.