Zhimin Chen

+1(858) 319-6270 zhiminc@clemson.edu

EDUCATION

Clemson University   Aug. 2020 - Present
Ph.D. in Automotive Engineering
Advisor: Bing Li

The Ohio State University   Aug. 2018 - May.2020
Master of Electrical and Computer Engineering

Northeastern University, China   Sep. 2014 - Jul. 2018
Bachelor of Electronic Engineering

RESEARCH INTERESTS

I am primarily focused on studying computer vision and deep learning, with a particular emphasis on 3D self-supervised learning [1, 2, 3], 3D semi-supervised learning [4, 6], and multi-modality learning [1, 2, 3, 6]. I am also interested in exploring the utilization of foundational models in 3D areas [3]. Furthermore, I always welcome the opportunity to venture into new research areas.

Technical Skills

- **Programming:** Python, Linux/Unix, CUDA
- **Language:** Mandarin, English

RESEARCH EXPERIENCE

Clemson University, Research Assistant   Aug.2020 - Present

Multi-modal self-supervised learning based on foundation models [1].

- Propose a self-supervised 3D method named Bridge3D for 3D scene understanding based on multiple foundation models and masked autoencoders.
- Outperform SOTA methods by at most 10.3% in ScanNet, SUN RGB-D, and S3DIS datasets in both 3D object detection and segmentation tasks.

2D to 3D knowledge distillation by masked autoencoder [2].

- Investigate and analyze challenges in 2D to 3D knowledge distillation and propose an innovative 2D to 3D knowledge distillation method utilizing masked autoencoders.
- Achieve SOTA performance in ModelNet40 and ScanObjectNN dataset in 3D object detection and classification tasks.

Class-level confidence based 3D semi-supervised learning [4].

- Propose a novel dynamic thresholding and resampling strategy based on class-level confidence for 3D semi-supervised learning.
- Outperform the SOTA method by at most 5.9% in ModelNet40, ScanObjectNN, ScanNet, and SUN RGB-D datasets.

Prototype-based multi-modal semi-supervised learning [6].

- Propose a novel multimodal semi-supervised learning method by introducing consistency constraint and a multimodal contrastive prototype loss.
- Outperform SOTA methods in the ModelNet40 dataset by at most 4.7%.

3D self-supervised learning for autonomous driving Data。

- Propose a self-supervised pretraining method for pillar or voxel-based 3D backbones in the Waymo dataset.
- Validate the performance of the pre-trained backbone in outdoor 3D object detection tasks.

Publications

[1] **Zhimin Chen**, Yingwei Li, Longlong Jing, Bing Li " Multi-view 2D-to-3D Self-Supervised Knowledge Distillation via Multi-Modality Masked Autoencoder." (2023). To be submitted

[2] Longlong Jing, **Zhimin Chen**, Bing Li, and Yingli Tian. "Self-Supervised Modality-Invariant and Modality-Specific Feature Learning for 3D Objects." (2021).

Publications

[3] **Zhimin Chen**, and Bing Li. "Bridging the Domain Gap: Self-Supervised 3D Scene Understanding with Foundation   Models." Advances in neural information processing systems (Neurips). 2023.

[4] **Zhimin Chen**, Longlong Jing, Liang Yang, Yingwei Li, and Bing Li. "Class-Level Confidence Based 3D Semi-Supervised Learning." In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), pp. 633-642. 2023.

[5] Satya R. Jaladi, **Zhimin Chen**, Narahari R. Malayanur, Raja M. Macherla, Bing Li "End-To-End Training and Testing Gamification Framework to Learn Human Highway Driving." 2022 IEEE 25th International Conference on Intelligent Transportation Systems (ITSC). IEEE, 2022.

[6] **Zhimin Chen**, Longlong Jing, Yang Liang, YingLi Tian, Bing Li"Multimodal Semi-Supervised Learning for 3D Objects." The British Machine Vision Conference (BMVC). 2021.