

Ziyu Zhao

Mobile: (1)352-871-1917

email: ziyuz@email.sc.edu

homepage: <https://ziyuz-vision.github.io/>

EDUCATION

Ph. D in Computer Science

University of South Carolina

Sep 2021 - present

MS in Computer Engineering (GPA: 3.72 / 4.0)

University of Florida

Aug 2019 - May 2021

BS in Mechanical Engineering (GPA: 91 / 100)

Northwestern Polytechnical University

Sep 2014-May 2018

RESEARCH INTERESTED

Computer vision, especially in cross-modal learning, segmentation (2D,3D) and image restoration, as well as 3D Neural Radiance Field and 3D reconstruction based on diffusion models.

ACADEMIC EXPERIENCE

Research assistant in Dr. Dawei Li 's lab, University of Vermont

Mar 2020 – Aug 2020

- Collaborated with other researchers in planning, designing, implementing, analytic reporting all research informatics applications.
- Developed programming to identify the specific DNA sequences, microRNAs that extracted from the mouse body.
- Consistently provided updates and shared numerous valuable insights during the team meetings.

Cross-modal point cloud semantic segmentation

Jan 2022 – Apr 2022

- Engineered an innovative **cross-modal few-shot learning** framework between 2D images and 3D point clouds for 3D point cloud semantic segmentation.
- Formulated a novel mini 2D image dataset encompassing the requisite categories for segmentation derived from the 3D point cloud dataset.
- Integrated **estimated depth** of images and pixel intensity to bridge the modality gap, and introduced a co-embedding network to further fill the domain gap.

Cross-modal Few-shot 3D Point Cloud Semantic Segmentation via View Synthesis

Jan 2023 – May 2023

- Proposed a novel cross-modal few-shot 3D point cloud semantic segmentation method based on multi-view synthesis over 2D images.
- Employed a novel attention-aware module in the feature embedding network and a weighted prototype module to align 2D-3D input spaces.

Aug-NeRF: Training Stronger Neural Radiance Fields with Triple-Level Physically-Grounded Augmentations

- Developed a triple-level augmentation framework for NeRF that injects worst-case perturbations into input coordinates, intermediate features, and pre-rendering outputs to improve view synthesis.
- Achieved up to 1.5dB PSNR gain in novel view synthesis while enabling recovery from corrupted images through implicit smooth geometry regularization.

Few-shot point cloud semantic segmentation based on class-specific Transformer network

May 2022 – Aug 2022

- Proposed an innovative stratified transformer network for 3D point cloud semantic segmentation.
- Designed a multi-layer transformer network to aggregate query point cloud features based on class-specific support features, significantly reducing computational complexity.

Adaptive Implicit Representation Mapping for Ultra High-Resolution Image Segmentation

Jan 2024 - present

- Conducted experiments to explore the impact of receptive fields on conventional 2D implicit representation mapping and analyze the limitations of existing implicit mapping function.
- Employed the semantic affinity learning from self-attention in supervised semantic segmentation.
- Engineered an adaptive implicit representation mapping for UHR image semantic segmentation, integrating pixel-wise features and global semantic information to enhance segmentation performance.

PROFESSIONAL EXPERIENCE

Reviewer of AAAI, ECCV, ACM MM, TMM, TPAMI

Graduate instructional assistant, University of South Carolina

Sep 2021 - present

- Algorithms (Java, Python); General Applications Programming (HTML/CSS and JavaScript)
- Big Data Analytics (graduate level): My responsibilities included conducting hands-on lab sessions, guiding students through complex concepts, conducting regular code reviews. For example, I facilitated sessions on decision trees and introduced ensemble methods like Random Forest, emphasizing their relevance in handling large-scale datasets efficiently.
- Computer architecture; Embedded system; Operating system

PUBLICATION

- **Ziyu Zhao**, Zhenyao Wu, Xinyi Wu, Canyu Zhang, and Song Wang, “Crossmodal few-shot 3d point cloud

semantic segmentation,” in ACM International Conference on Multimedia, MM ’22, p. 4760–4768

- **Ziyu Zhao**, Xiaoguang Li, Canyu Zhang, PingPing Cai, Song Wang, “Crossmodal Few-shot 3D Point Cloud Semantic Segmentation via View Synthesis”. in ACM International Conference on Multimedia, MM ’24, p. 2345–2353
- Zhang, Canyu, Wu, Zhenyao, Wu, Xinyi, **Zhao, Ziyu**, Wang, Song, “Few-Shot 3D Point Cloud Semantic Segmentation via Stratified Class-Specific Attention Based Transformer Network,” Proceedings of the AAAI Conference on Artificial Intelligence. 37. 3410-3417. 10.1609/aaai.v37i3.25449.
- **Ziyu Zhao**, Xiaoguang Li, Song Wang, “DPSeg: Dual-Prompt Cost Volume Learning for Open-Vocabulary Semantic Segmentation”. arXiv, submitted in CVPR 2025
- **Ziyu Zhao**, Xiaoguang Li, Canyu Zhang, Pingping Cai, Song Wang, “Leveraging Adaptive Implicit presentation Mapping for Ultra High-Resolution Image Segmentation”. arXiv, submitted in CVPR 2025
- **PingPing Cai, Ziyu Zhao, Song Wang**, “Efficient Point Cloud Denoising via Direction Aware Projection” . arXiv, submitted in CVPR 2025
- Xiong LU, Shujuan Li, **Ziyu Zhao**, Bin Xin, “Modeling and Control of WEDM Process of Silicon Single Crystal”, *Journal of Mechanical Engineering*, 2018, 54 (17): 149-156 CN: 11-2187/TH, ISSN: 0577-6686

AWARDS

- **Achievement Award Scholarship**, Gainesville, FL 20th Aug 2021
- **Achievement Award Scholarship**, Gainesville, FL 6th Jan 2021
- **Achievement Award Scholarship**, Gainesville, FL 20th Aug 2020
- **Silver Award** in The 3rd China College Students’ “Internet Plus” Innovation & Entrepreneurship Competition (July, 2017)

SKILLS

- **Programming**: Python, C, C#, C++, Java, JavaScript, SQL, MATLAB
- **Software**: PyCharm, LT-spice, MATLAB, Mathematica, Keil uVision5, Eclipse, Quartus, ModelSim, Maxterm
- **Deep Learning Framework**: Proficient at PyTorch platform, familiar with TensorFlow, Keras and Caffe
- **Other skills**: Oscilloscope, Digital Multi-meter, Solder gun and paste