Ziyu Zhao

Mobile: (1)352-871-1917 email: ziyuz@email.sc.edu

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)	Xi'an University of Technology	*Sep 2014-May 2018*

RESEARCH INTERESTED

Computer vision, especially in cross-modal learning, *diffusion models*, segmentation (2D,3D) and image restoration, as well as Implicit Neural Representation and *Neural Radiance Field*

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.

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.

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.

Efficient Point Cloud Denoising via Direction Aware Projection *Aug 2023 – Nov 2023*

- Designed an efficient point cloud denoising pipeline.
- Introduced a novel direction-aware projection module to estimate better moving directions and distances for noisy points to achieve better point distribution.
- Proposed a new shape attention module to calculate attention scores based on geometric clues and high-level features for point cloud denoising task.

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

Greater University Tutoring Service, University of South Carolina *Sep 2022 – Dec 2022*

Undergraduate Program

- Provided academic tutoring in Calculus, Algebra and Chemistry
- Provided academic advice to freshmen who had undecided major

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, Canyu Zhang, Pingping Cai, Song Wang, "Leveraging Adaptive Implicit presentation Mapping for Ultra High-Resolution Image Segmentation". Submitted in CVPR 2025
- PingPing Cai, **Ziyu Zhao**, Song Wang, "Efficient Point Cloud Denoising via Direction Aware Projection" . 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