

# HAIDONG ZHU

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## EXPERIENCE

Research Scientist @ Waymo, New York, NY	Jun. 2024 - now
Research Intern @ Microsoft, Redmond, WA	May. 2023 - Aug. 2023
Applied Scientist Intern @ Amazon, Bellevue, WA	May. 2022 - Aug. 2022
Research Intern @ Bytedance Inc., Mountain View, CA	May. 2021 - Aug. 2021

## EDUCATION

Ph.D., Computer Science, University of Southern California, 2019 - 2024  
B.E., Electronic Information Science and Technology, Tsinghua University, 2015 - 2019

## SELECTED EXPERIENCE

<b>Research/AI Foundation Team, Waymo LLC</b> <i>Research Scientist</i>	<b>New York, NY</b> <i>Jun. 2024 - present</i>
<ul style="list-style-type: none"><li><b>Auto Labeling:</b> Leveraged large language models (Gemini) for automated generation of semantic labels in Bird's-Eye-View (BEV) data, streamlining the training pipeline for Waymo's BEVNet perception models.</li><li><b>Generative Modeling (Diffusion):</b> Developed and implemented a point diffusion algorithm for high-fidelity roadgraph construction, achieving a 30% improvement in accuracy over baseline methods.</li><li><b>Semantic NeRF and Segmentation:</b> Integrated semantic understanding directly into hierarchical Neural Radiance Field (NeRF) representations for BEV scenes. This approach enables effective training using partial or incomplete auto-labels, achieving segmentation performance comparable to models trained with full human annotations.</li></ul>	
<b>IRIS Computer Vision Lab, University of Southern California</b> <i>Research Assistant, Advisor: Prof. Ram Nevatia</i>	<b>Los Angeles, CA</b> <i>Aug. 2019 - May. 2024</i>
<ul style="list-style-type: none"><li><b>3D Vision and Rendering:</b> Improved the performance of 3D reconstruction using implicit functions and Neural Radiance Fields (NeRF). [ECCV 2020,CVPRW 2023]</li><li><b>Biometrics:</b> Developed and evaluated methods for biometric identification using gait analysis, 3D body shape inference, and other modalities. [WACV 2023,IJCB 2023,WACV 2024,CVPR 2024]</li><li><b>Vision and Language:</b> Investigated vision-language grounding, compositional learning, and prompt learning with LLMs for enhanced scene understanding and low-shot classification. [WACV 2021, TAC 2020,WACV 2024,CVPR 2024]</li><li><b>Skeleton Action Recognition:</b> Researched action recognition techniques based on skeleton sequences extracted from videos. [ICPR 2022]</li><li><b>Sentiment Analysis:</b> Implemented self-supervised learning approaches for multimodal sentiment classification via cross-modal matching. [ICASSP 2022]</li><li><b>Referring Relationship:</b> Analyzed spatial and semantic relationships between objects detected within images for contextual understanding. [CVPRW 2020]</li></ul>	
<b>Applied Science Group, Microsoft.</b> <i>Research Intern, Advisor: Dr. Tianyu Ding</i>	<b>Redmond, WA</b> <i>May. 2023 - Aug. 2023</i>
<ul style="list-style-type: none"><li><b>Few-shot Generalizable NeRF:</b> Extended generalizable NeRF architectures to perform effectively with limited reference views (few-shot learning). [ECCV 2024]</li><li><b>NeRF for Scene Editing:</b> Applied generalizable NeRF models to enable consistent 3D scene editing and manipulation.</li></ul>	
<b>Lab 126, Amazon.</b> <i>Applied Scientist Intern, Advisor: Dr. Yuyin Sun</i>	<b>Bellevue, WA</b> <i>May. 2022 - Aug. 2022</i>
<ul style="list-style-type: none"><li><b>Multimodality NeRF:</b> Developed a NeRF framework capable of integrating and reconstructing scenes from multimodal inputs (e.g., RGB, depth). [ICRA 2023]</li><li><b>Point Cloud Registration:</b> Implemented and evaluated algorithms for robust 3D point cloud registration and alignment across different captures.</li></ul>	
<b>Intelligent Creation Lab, ByteDance Inc.</b> <i>Research Intern, Advisor: Dr. Ye Yuan</i>	<b>Mountain View, CA</b> <i>May. 2021 - Aug. 2021</i>
<ul style="list-style-type: none"><li><b>Mesh Reconstruction:</b> Developed techniques for reconstructing fine-grained 3D human mesh models from single images. [ICPR 2022]</li><li><b>Generative Clothing Network:</b> Designed a generative network for automatically creating and applying realistic clothing geometry/textures to 3D human body models.</li></ul>	

## SELECTED PUBLICATIONS

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For the full publication list, please refer to my [Google Scholar](#). (\*) indicates equal contribution.

1. 3-D Representation and Rendering
  - Haidong Zhu\* et al., **CaesarNeRF: Calibrated Semantic Representation for Few-shot Generalizable Neural Rendering**, *European Conference on Computer Vision (ECCV)*, 2024. [Project][Paper][Code]
  - Haidong Zhu\* et al., **CAT-NeRF: Constancy-Aware Tx<sup>2</sup>Former for Dynamic Body Modeling**, *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2023. [Paper][Code]
  - Haidong Zhu et al., **Multimodality Neural Radiance Field**, *IEEE International Conference on Robotics and Automation (ICRA)*, 2023. [Paper]
  - Yueqi Duan\*, Haidong Zhu\*, et al., **Curriculum DeepSDF**, *European Conference on Computer Vision (ECCV)*, 2020. [Paper][Code]
2. Biometrics
  - Wanrong Zheng\*, Haidong Zhu\* et al., **GaitSTR: Gait Recognition with Two-stream Sequential Refinement**, *IEEE Transactions on Biometrics, Behavior, and Identity Science (TBIOM)*, 2024. [Paper]
  - Haidong Zhu et al., **SEAS: Shape Aligned Supervision for Person Re-Identification**, *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024. [Paper]
  - Haidong Zhu et al., **ShARc: Shape and Appearance Recognition for Person Identification In-the-wild**, *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2024. [Paper]
  - Haidong Zhu\* et al., **GaitRef: Gait Recognition with Refined Skeletons**, *IEEE International Joint Conference on Biometrics (IJCB)*, 2023. [Paper][Code]
  - Haidong Zhu et al., **Gait Recognition Using 3-D Human Body Shape Inference**, *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2023. [Paper][Supp]
3. Vision and Language
  - Zhaoheng Zheng, ..., Haidong Zhu, et al., **Large Language Models are Good Prompt Learners for Low-Shot Image Classification**, *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024. [Paper]
  - Zhaoheng Zheng, Haidong Zhu, et al., **CAILA: Concept-Aware Intra-Layer Adapters for Compositional Zero-Shot Learning**, *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2024. [Paper]
  - Haidong Zhu et al., **Self-supervised Learning for Sentiment Analysis via Image-text Matching**, *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2022. [Paper]
  - Haidong Zhu, et al., **Utilizing Every Image Object for Semi-supervised Phrase Grounding**, *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2021. [Paper]
  - Chuanzi He, Haidong Zhu, et al, **CPARR: Category-based Proposal Analysis for Referring Relationships**, *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2020. [Paper]
4. Biomedical Images Analysis
  - Haidong Zhu, et al., **Pick-and-Learn: Automatic Quality Evaluation for Noisy-Labeled Image Segmentation**, *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2019. [Paper]
  - Brian Matejek, Daniel Haehn, Haidong Zhu, et al., **Biologically Constrained Graphs for Global Connectomics Reconstruction**, *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019. [Paper][Code]

## PROFESSIONAL ACTIVITIES

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Reviewer:

- Conferences: ICME [2020-2022], BMVC [2020-now], WACV [2021-now], IROS [2021], AAAI [2022-now], MICCAI [2022], ICPR [2022], ECCV [2022-now], CVPR [2023-now], ICCV [2023], EMNLP [2022].
- Workshops: MULA [2020-now],
- Journals: IJCV [2021], T.MM [2022-now], MM [2022], TPAMI [2022-now]

## TECHNICAL SKILLS

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**Deep Learning Framework** Tensorflow, Keras, PyTorch, Theano, Caffe, Jax

**Programming Language** C/C++, Python, MATLAB, Mathematica, Verilog,