

# Ziyao Zeng (Adonis)

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## Summary

- Intern with **Prof. Jianbo Shi** at UPenn GRASP Lab; **Prof. Xuming He** at ShanghaiTech PLUS Lab. **Reviewer of CVPR 2022**
- Broadly interest in **Computer Vision**, mainly in **Strong Perception** and **Cross-Modality**, particularly **3D Perception** and **Vision-Language Model**

## Educations

### ShanghaiTech University

Sept. 2019 - (Expected) June 2023

**B.Eng. in Computer Science, Major** | Innovation and Entrepreneurship, Minor

- Overall GPA: **3.59/4.00, rank 37/166**

-International Summer Program, Osaka University, June 2022 | Entrepreneurial Mindshift Program, Babson College, March 2021

## Publications (\*: equal contribution)

### Can Language Understand Depth?

Renrui Zhang\*, Ziyao Zeng\*, Ziyu Guo, Yafeng Li | **Mentor: Renrui Zhang**, Ph.D. candidate at MMLab, CUHK

ACM Multimedia 2022 (Brave New Idea) | Link: <https://arxiv.org/abs/2207.01077>

-We are **the first to** conduct and analyse **zero-shot adaptation** from the semantic language knowledge to quantified downstream vision tasks.

-We are **the first to** perform **zero-shot training-free monocular depth estimation** using a vision-language model.

-Our DepthCLIP **surpasses existing unsupervised methods** and even **approaches the early fully-supervised networks**.

### DSPoint: Dual-scale Point Cloud Recognition with High-frequency Fusion

Renrui Zhang\*, Ziyao Zeng\*, Ziyu Guo\*, Xinben Gao, Kexue Fu | **Mentor: Prof. Jianbo Shi**, GRASP Lab, University of Pennsylvania

arXiv technical report, 2021, in submission to ICRA 2023 | Link: <https://arxiv.org/pdf/2111.10332.pdf>

-We proposed DSPoint to **conduct dual-scale processing** with local point convolution and global voxel attention for efficient point cloud processing.

-For better feature blending, we conduct inter-scale cross-modality interaction by **communicating high-frequency coordinates information**.

### VT-CLIP: Enhancing Vision-Language Models with Visual-guided Texts

Renrui Zhang\*, Longtian Qiu\*, Wei Zhang, Ziyao Zeng | **Mentor: Renrui Zhang**, Ph.D. candidate at MMLab, CUHK

arXiv technical report, 2021, in submission to CVPR 2023 | Link: <https://arxiv.org/pdf/2112.02399.pdf>

-To improve adaptation of Contrastive Vision-Language Pre-training (CLIP), we enhance vision-language modeling **via visual-guided texts**.

-Specifically, we **guide the text feature to adaptively explore informative regions on the image** and aggregate the visual feature by cross-attention.

### Rethinking Audio-Visual Sound Separation with Mask Transformers

Jiabao Chen, Renrui Zhang, Dongze Lian, Ziyao Zeng, Jiaqi Yang, Xinhao Liu | **Mentor: Prof. Jianbo Shi**, GRASP Lab, University of Pennsylvania

In submission to ICLR 2023 | Link: Coming soon

-We **re-formulate visual-sound separation as a sound Mask Transformer task**, with a flexible query expansion mechanism.

-We demonstrate state-of-the-art performance, with **up to 44.2 % improvement** of SDR on MUSIC benchmark.

## Course Project

### Twitter Emotion Classification (CS181 Artificial Intelligence)

**Mentor: Prof. Kewei Tu**, ShanghaiTech University | Link: [https://adonis-galaxy.github.io/homepage/research/AI\\_CS181\\_project.pdf](https://adonis-galaxy.github.io/homepage/research/AI_CS181_project.pdf)

### Generalized DUQ: Generalized Deterministic Uncertainty Quantification (CS282 Machine Learning)

**Mentor: Prof. Xuming He**, PLUS Lab, ShanghaiTech University | Link: [https://adonis-galaxy.github.io/homepage/research/ML\\_CS282\\_project.pdf](https://adonis-galaxy.github.io/homepage/research/ML_CS282_project.pdf)

### Seek Common while Shelving Differences: A New Way for dealing with Noisy Labels (CS280 Deep Learning)

**Mentor: Prof. Xuming He**, PLUS Lab, ShanghaiTech University | Link: [https://adonis-galaxy.github.io/homepage/research/DL\\_CS280\\_project.pdf](https://adonis-galaxy.github.io/homepage/research/DL_CS280_project.pdf)

## Research / Working Experience

- GRASP Lab, University of Pennsylvania** April 2021 - Present  
-**Mentor: Prof. Jianbo Shi** | Project: DSPoint, Self-supervised Image Segmentation, Monocular 3D Object Detection
- Shanghai AI Lab** Nov. 2021 - July. 2022  
-**Mentor: Renrui Zhang**, Ph.D. candidate at MMLab, CUHK | Project: DepthCLIP, VT-CLIP
- PLUS Lab, ShanghaiTech University** July 2020 - June 2021  
-**Mentor: Prof. Xuming He** | Project: Mix-data Anomaly Segmentation, Noisy Labels Classification, Uncertainty Estimation
- UISEE AI Lab, UISEE Technology** July 2021 - April 2022  
-Algorithm Engineer | Develop point cloud recognition & monocular 3D object detection algorithm for self-driving cars
- Shanghai Advanced Research Institute, CAS** Aug. 2020 - June 2021  
-Intern Lecturer | Teaching advanced scientific topic to public, including deep learning and computer vision

## Service

**Reviewer: CVPR 2022** (Emergency reviewer, reviewing two papers); ACM SIGMM member

## Tutoring Experience

Freshman Mentor | Instructed by Prof. Rui Fan

2020 Fall – 2021 Spring

## Awards / Competitions

Merit Student of ShanghaiTech University (Top 15%)

2021

State Grid AI Innovation Competition in Power Dispatch and Control (Top 10%, 24/242)

2021

## Skills

Python, C/C++, PyTorch, Unity/C#, Bilingual (Chinese/English: CET6-607, GRE-327+4, TOEFL-103)