

Shaoyuan Xie

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EDUCATION BACKGROUND

University of California, Irvine

Irvine, CA

Ph.D. in Computer Science

Sep.2023-Present

Huazhong University of Science & Technology (HUST)

Wuhan, China

B.Eng. in Automation

Sep.2019-Jun.2023

• GPA: 3.97/4.0 Ranking: 1/79

• China National Scholarship, Ministry of Education of PRC (Highest Honor, **Top 0.2%** Nationwide), **TWICE**

PUBLICATIONS

• RoboDepth: Robust Out-of-Distribution Depth Estimation under Corruptions

Lingdong Kong, **Shaoyuan Xie**, Hanjiang Hu, Lai Xing Ng, Benoit R Cottureau, Wei Tsang Ooi

Conference on Neural Information Processing Systems (NeurIPS), Datasets and Benchmarks Track, 2023

• Benchmarking Bird's Eye View Detection Robustness to Real-World Corruptions

Shaoyuan Xie, Lingdong Kong, Wenwei Zhang, Jiawei Ren, Liang Pan, Kai Chen, Ziwei Liu

International Conference on Learning Representations Workshop (ICLRW), 2023

• On the Adversarial Robustness of Camera-based 3D Object Detection

Shaoyuan Xie, Zichao Li, Zeyu Wang, Cihang Xie

Transactions on Machine Learning Research (TMLR), 2024

EXPERIENCE

OpenMMLab, Shanghai AI Lab

Shanghai, China

Topic: Large Language Model (LLM) Call Tools [[Github](#)]

June.2023- Sep.2023

- Survey on LLM for code generation and give invited talks within OpenMMLab group
- Implement code feature of LLM to solve math problems
- Build fine-tuning dataset for InternLM to improve coding ability

S-Lab, Nanyang Technological University

Singapore

Topic: Robust 3D Perception [[Github](#)]

Dec.2022- May.2023

- Generate nuScenes-C dataset
- Comprehensive benchmark to understand of robustness of 3D BEV perception models
- Comprehensive benchmark to understand of robustness of depth estimation models

VLAA Lab, University of California Santa Cruz

Santa Cruz, CA

Advisor: Prof. Cihang Xie

Sep.2022- Nov.2022

Topic: On the Adversarial Robustness of Camera-based 3D Object Detection

- Propose pixel-based & patch-based attack algorithms to generate adversarial examples for camera-based 3D object detection models and evaluate attack performance on the nuScenes dataset
- Benchmark adversarial robustness of camera-based 3D object detection models, such as BEVFormer, FCOS3D, DETR3D, BEVDepth
- Leverage the MMCV framework and incorporate adversarial attacks code into MMDetection3D framework

CCVL Lab, Johns Hopkins University

Baltimore, MD

Advisor: Prof. Cihang Xie and Prof. Alan Yuille

Jun.2022-Sep.2022

Topic: Multimodal (CLIP) & OOD Robustness

- Train SLIP and SimCLR on the Redcaps dataset and fine-tune them on ImageNet, explore the effect of text encoder on OOD dataset (ImageNet-A, Stylized-ImageNet, and ImageNet-Sketch) by using different sizes of language transformer model
- Investigate OOD robustness of zero-shot CLIP model with different pre-train datasets (WIT, Redcaps, YFCC15M)
- Explore the transferability of OOD robustness under knowledge distillation, adopt different distillation methods, including knowledge distillation and intermediate feature alignment, maximize disagreement between student and

teacher models with AugMax augmentation, and accelerate model training with Google Cloud TPU Pod

Yang Xiao Research Group, HUST

Wuhan, China

Advisor: Prof. Yang Xiao

Jan.2022-May.2022

Topic: Multi-modal Adversarial Training for 3D Point Cloud Defense

- Design a simple multi-modal framework for point cloud adversarial examples detection with an accuracy of over 80%
- Render point clouds into a depth map, leverage points, and corresponding depth map for multi-modal learning
- Investigate the adversarial self-distillation paradigm by using CLIP-like contrastive objective function and adversarial training
- Discover that depth map-based CNN are also vulnerable to gradient-free adversarial attacks to the original point cloud; under exhaustive search, the accuracy of depth map-based models can fall to 0%

HONORS & AWARDS

- Meritorious Winner, Mathematical Contest in Modeling (MCM) *Feb.2022*
- National Scholarship, Ministry of Education of PRC (Highest Honor, **Top 0.2%**), TWICE *Oct.2020 & Oct.2021*
- Merit Student of HUST (Top 7%), TWICE *Sep.2020 & Oct.2021*
- Excellent Undergraduate Student of HUST (**Top 1%**) *Sep.2020*
- National First Prize, The Chinese Mathematics Competition (CMC) *Oct.2020*
- First Prize, The Chinese Mathematics Competition, Hubei Division *Oct.2020*