

Yunhao(Andy) Ge

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Education

University of Southern California

PHD Candidate, ilab, Computer Science Department

- Amazon ML Fellowship
- Annenberg Graduate Fellowship at University of Southern California
- Advisor: Prof. Laurent Itti

Los Angeles, USA

Aug. 2019 - Present

Stanford University

Visiting PHD Student, Stanford Vision and Learning Lab (SVL), Computer Science Department

- Advisor: Prof. Jiajun Wu

Stanford, USA

Dec. 2022 - Present

Shanghai Jiao Tong University

MASTER OF SCIENCE, Robotics and Intelligence Group, Robotics Institute

- Overall **Ranking 6th/210**
- Advisor: Prof. Weixin Yan & Huanhua Liao & Prof. Yanzheng Zhao
- Honor: Outstanding Graduate Thesis Award

Shanghai, China

Sep. 2016 - June 2019

Shandong University

BACHELOR OF ENGINEERING, Control Engineering and Mechatronics

- Overall **Ranking 1st/66**
- Honor: Outstanding Undergraduate Thesis Award

Jinan, China

Sep. 2012 - June 2016

Research Interests

I'm interested in Machine Learning, Computer vision, and their applications towards Trustworthy, Human-like AI and Data-centric AI. My current research focuses include:

- 1) **Reliable Deep Learning**: Interpretability, Robustness, Out-of-distribution (OOD) Detection
- 2) **Synthetic data for Vision/Robotics (Sim2Real)**: using neural renderer (NeRF, DALL-E / Stable Diffusion, GAN) to synthesize realistic and physical plausible data to solve real-world Computer Vision and Robotics problems with minimal supervision
- 3) **Human-inspired Learning Algorithm**: Continual Learning, Multi-modal Models, Visual Reasoning

Selected Publications [\[Google Scholar\]](#)

[1] Improving Zero-shot Generalization and Robustness of Multi-modal Models

Yunhao Ge*, Jie Ren*, Yuxiao Wang, Andrew Gallagher, Ming-Hsuan Yang, Laurent Itti, Hartwig Adam, Balaji Lakshminarayanan, and Jiaping Zhao (*=equal contribution) [PDF](#)

IEEE/ CVF International Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.

[2] Neural-Sim: Learning to Generate Training Data with NeRF

Yunhao Ge, Harkirat Behl*, Jiashu Xu*, Suriya Gunasekar, Neel Joshi, Yale Song, Xin Wang, Laurent Itti, Vibhav Vineet (*=equal contribution) [PDF](#) [Code](#)

European Conference on Computer Vision (**ECCV**), 2022.

[3] Contributions of Shape, Texture, and Color in Visual Recognition

Yunhao Ge*, Yao Xiao*, Zhi Xu, Xingrui Wang, Laurent Itti (*=equal contribution) [PDF](#) [Code](#)

European Conference on Computer Vision (**ECCV**), 2022.

[4] DALL-E for Detection: Language-driven Compositional Image Synthesis for Object Detection

Yunhao Ge, Jiashu Xu, Brian Nlong Zhao, Laurent Itti, Vibhav Vineet [arXiv preprint, 2022.](#)

[5] EM-guided Cut-Paste with DALL-E Augmentation for Image-level Weakly Supervised Instance Segmentation

Yunhao Ge, Jiashu Xu, Brian Nlong Zhao, Laurent Itti, Vibhav Vineet [arXiv preprint, 2022.](#)

[6] Invariant Structure Learning for Better Generalization and Causal Explainability

Yunhao Ge, Sercan Ö. Arik, Jinsung Yoon, Ao Xu, Laurent Itti and Tomas Pfister [arXiv preprint, 2022.](#)

[7] A Peek Into the Reasoning of Neural Networks: Interpreting with Structural Visual Concepts

Yunhao Ge, Yao Xiao, Zhi Xu, Meng Zheng, Srikrishna Karanam, Terrence Chen, Laurent Itti and Ziyang Wu

[PDF](#) [Github](#) [Website](#)

IEEE/CVF International Conference on Computer Vision and Pattern Recognition (**CVPR**), 2021.

[8] Zero-shot Synthesis with Group-Supervised Learning

Yunhao Ge, Sami Abu-El-Haija, Gan Xin and Laurent Itti [PDF](#) [Code](#) [Fonts Dataset](#) [Website](#)

International Conference on Learning Representations (**ICLR**), 2021.

[9] Encouraging Disentangled and Convex Representation with Controllable Interpolation Regularization

Yunhao Ge, Zhi Xu, Yao Xiao, Gan Xin, Yunkui Pang and Laurent Itti [PDF](#)

IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), 2023.

[10] Graph Autoencoder for Graph Compression and Representation Learning

Yunhao Ge*, Yunkui Pang*, Linwei Li, Laurent Itti (*=equal contribution) [PDF](#) [Code](#) [Img2SceneGraph](#)

Neural Compression: From Information Theory to Applications-Workshop@ (**ICLR**), 2021.

[11] Pose Augmentation: Class-agnostic Object Pose Transformation for Object Recognition

Yunhao Ge, Jiaping Zhao, Laurent Itti [PDF](#) [Github](#)

European Conference on Computer Vision (**ECCV**), 2020.

[12] Beneficial Perturbation Network for designing general adaptive artificial intelligence systems

Shixian Wen, Amanda Rios*, Yunhao Ge* and Laurent Itti (*=equal contribution) [PDF](#)

IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**), Jan 2021.

[13] Unpaired MR to CT Synthesis with Explicit Structural Constrained Adversarial Learning

Yunhao Ge*, Dongming Wei*, Zhong Xue, Qian Wang, Xiang Zhou, Yiqiang Zhan, Shu Liao (*=equal contribution) [PDF](#) [Code](#)

IEEE International Symposium on Biomedical Imaging (**ISBI**), 2019.

[14] Synthesis and inpainting-based MR-CT registration for image-guided thermal ablation of liver tumors

Dongming Wei, Sahar Ahmad, Jiayu Huo, Wen Peng, Yunhao Ge, Zhong Xue, Pew-Thian Yap, Wentao Li, Dinggang Shen, Qian Wang [PDF](#)

International Conference on Medical Image Computing and Computer-Assisted Intervention (**MICCAI**), 2019.

[15] Unpaired Whole-body MR to CT Synthesis with Correlation Coefficient Constrained Adversarial Learning

Yunhao Ge, Zhong Xue, Tuoyu Cao, Shu Liao [PDF](#) [Code](#)

SPIE-Medical Imaging, 2019 [oral]

Intern & Work Experience

Google Research

Student Researcher

Los Angeles, CA, USA

May. 2022 - current

- Research topic: Improving Zero-shot Generalization and Robustness of Multi-modal models
- Advisor: [Jiaping Zhao](#), [Jie Ren](#), [Balaji Lakshminarayanan](#), [Ming-Hsuan Yang](#)

Google Cloud AI

Student Researcher

Mountain View, CA, USA

Aug. 2021 - Jan. 2022

- Research topic: Explainable Concept learning in structural data
- Advisor: [Sercan Arik](#), [Jinsung Yoon](#)

Microsoft Research

Research Intern

Redmond, WA, USA

May 2021 - Aug. 2021

- Research topic: Automatic using generative models to boost discriminative models
- Advisor: [Vibhav Vineet](#), [Neel Joshi](#)

UII America, Inc

Research Intern

Boston, MA, USA

May 2020 - Aug. 2020

- Research topic: General Visual Reasoning Framework: A Peek Into the Reasoning of Neural Networks: Interpreting with Structural Visual Concepts
- Advisor: [Ziyang Wu](#), [Srikrishna Karanam](#)

Flexiv Robotics

Computer Vision Research Engineer

Shanghai, China

May 2019 - Aug. 2019

- Research topic: Robotics adaptive massage based on human pose detection and tracking with a lightweight local human 3D pose detection framework
- Advisor: [Cewu Lu](#), Shuyun Chong

United Imaging Intelligence

Research Intern

Shanghai, China

June 2018 - Apr. 2019

- Research topic: Unpaired Image Synthesis with Adversarial Learning
- Advisor: [Dinggang Shen](#), Shu Liao

Honors & Awards

SCHOLARSHIPS

Amazon ML Fellowship (2022) , USC-Amazon Center on Trustworthy AI	Aug. 2022
Annenberg Project Grant for simulating human imagination , awarded annually to 10 PhD students across USC for high-impact projects	April 2022
Annenberg Fellowship (PhD) , University of Southern California	Aug. 2019
National Scholarship (Graduate) , top graduate nationwide	Nov. 2017
National Scholarship (Undergraduate) , top undergraduate nationwide	Nov. 2015
KaiYuan Motivational Scholarship , top 0.5% in Shanghai Jiao Tong University	Apr. 2018
Presidential Scholarship , top 0.2% in Shandong University	Nov. 2015
BaoGang Excellent student Scholarship , 4 Places per year at Shandong University	Nov. 2015
First Prize Scholarship , three-year continuous	2013-2015

CONTESTS

The first prize , 2017 ROBOMASTER The World's Leading Robotics Competition (Responsible for the design of electronic control in robotics)	Aug. 2017
Rank 1st (preliminary competition) , Tianchi: Precision medical competition-Artificial Intelligence Aided genetic risk prediction of diabetes Pred-diabetes	Dec. 2017
The first prize , 9th International college students Ican innovation and entrepreneurship competition	Oct. 2015

Patent & software

Systems and methods for image processing Shu Liao, GE Yunhao , WEI Dongming US Patent App. 16/729,303.	US Patent July 2020
Pulmonary Nodular Assisted Detection System Based on AI(V1.0) Bin Li, Yunhao Ge 2018SR037095	Software Jan. 2018
A two-layer barrier free parking robotics based on bionic manipulator Yunhao Ge , Shangze Yang, Zheng Zhang, Weixin Yan, Yanzheng Zhao CN201610712048	Patent for invention Jan. 2017