

Yunhao(Andy) Ge

☎ (+1) 2136759836 | ✉ yunhaoge@usc.edu | 🏠 gyhandy.github.io | 📺 [gyhandy](#)

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 how could human efficiently teach AI to learn the human ability to perceive, understand, interact, and reason the physical world. My current research focuses include:

- 1) **Human-inspired Learning Algorithm**: Vision-Language Models, Lifelong Learning, Visual Reasoning
- 2) **Learning from Synthetic Data (Sim2Real)**: Using neural renderer (NeRF, Stable Diffusion, GAN) to synthesize realistic and physical plausible data to solve real-world Computer Vision and Robotics problems with minimal human supervision
- 3) **Reliable Deep Learning**: Interpretability, Robustness, Out-of-distribution (OOD) Detection

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

[1] Building One-class Detector for Anything: Open-vocabulary Zero-shot OOD Detection Using Text-image Models

Yunhao Ge*, Jie Ren*, Jiaping Zhao, Kaifeng Chen, Andrew Gallagher, Laurent Itti, and Balaji Lakshminarayanan (*=equal contribution) [arXiv preprint, 2023](#).

[2] Lightweight Learner for Shared Knowledge Lifelong Learning

Yunhao Ge, Yuecheng Li, Di Wu, Ao Xu, Adam M. Jones, Amanda Sofie Rios, Iordanis Fostiropoulos, Shixian wen, Po-Hsuan Huang, Zachary William Murdock, Gozde Sahin, Shuo Ni, Kiran Lekkala, Sumedh Anand Sontakke and Laurent Itti [PDF](#) [Code](#)
Transactions on Machine Learning Research (TMLR).

[3] 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.

[4] 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.

[5] 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.

[6] 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.](#)

[7] 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.](#)

[8] 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 Ziyan Wu

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

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

[9] 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.

[10] 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.](#)

[11] 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.

[12] 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.

[13] 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.

[14] 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.

[15] 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.

[16] 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.

[17] 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

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

Los Angeles, CA, USA

May. 2022 - current

Google Cloud AI

Student Researcher

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

Mountain View, CA, USA

Aug. 2021 - Jan. 2022

Microsoft Research

Research Intern

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

Redmond, WA, USA

May 2021 - Aug. 2021

UII America, Inc

Research Intern

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

Boston, MA, USC

May 2020 - Aug. 2020

Flexiv Robotics

Computer Vision Research Engineer

- 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

Shanghai, China

May 2019 - Aug. 2019

United Imaging Intelligence

Research Intern

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

Shanghai, China

June 2018 - Apr. 2019

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