Yunhao(Andy) Ge

(+1) 2136759836 | yunhaoge@usc.edu | gyhandy.github.io | gyhandy

Education

University of Southern California *Los Angeles, USA*

PHD, ilab, Computer Science Department *Aug. 2019 - Present*

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

Shanghai Jiao Tong University *Shanghai, China*

MASTER OF SCIENCE, Robotics and Intelligence Group, Robotics Institute *Sep. 2016 - June 2019*

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

Shandong University *Jinan, China*

BACHELOR OF ENGINEERING, Control Engineering and Mechatronics *Sep. 2012 - June 2016*

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

Research Interests

I'm interested in Machine Learning, Computer vision, and their applications towards Human-centric / Humanoid AI and Data-centric AI. My current research focuses include:
1) **Human-centric properties of AI models**: (Causal Explainability, Robustness, Domain Adaptation, Out-of-distribution Detection (OOD), Human-to-AI Knowledge Exchange)
2) **Simulate human cognitive learning ability**: (Continual Learning, Multi-modal (CLIP, LiT), Imagination, Reasoning, Visual Recognition)
3) **Data-centric AI**: using synthetic data and neural renderer (NeRF, DALL-E, GAN, VAE) to solve real-world computer vision problems (classification, detection, segmentation) with minimal supervision

Selected Publications

[1] 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.*

[2] 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.*

[3] DALL-E for Detection: Language-driven Context Image Synthesis for Object Detection

Yunhao Ge, Jiashu Xu, Brian Nlong Zhao, Laurent Itti, Vibhav Vineet arXiv preprint, 2022.

[4] 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.

[5] 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.*

[6] 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.*

[7] 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.*

[8] 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.*

[9] 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.*

[10] 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.*

[11] 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.*

[12] 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.*

[13] 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 — *Los Angeles, CA, USA*

Research Intern — *May. 2022 - Aug. 2022*

- 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 — *Mountain View, CA, USA*

Research Intern — *Aug. 2021 - Jan. 2022*

- Research topic: Explainable Concept learning in structural data
- Advisor: Sercan Arik, Jinsung Yoon

Microsoft Research — *Redmond,WA, USA*

Research Intern — *May 2021 - Aug. 2021*

- Research topic: Automatic using generative models to to boost discriminative models
- Advisor: Vibhav Vineet, Neel Joshi

UII America, Inc — *Boston, MA, USC*

Research Intern — *May 2020 - Aug. 2020*

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

Flexiv Robotics — *Shanghai, China*

Computer Vision Research Engineer — *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 — *Shanghai, China*

Research Intern — *June 2018 - Apr. 2019*

- Research topic: Unpaired Image Synthesis with Adversarial Learning
- Advisor: Dinggang Shen, Shu Liao

Honors & Awards

SCHOLARSHIPS

Amazon ML Fellowship, 50000$ (2022-2023) 3 PhD in USC — *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 — *US Patent*

Shu Liao, **GE Yunhao**, WEI Dongming US Patent App. 16/729,303. — *July 2020*

Pulmonary Nodular Assisted Detection System Based on AI(V1.0) — *Software*

Bin Li, **Yunhao Ge** 2018SR037095 — *Jan. 2018*

A two-layer barrier free parking robotics based on bionic manipulator — *Patent for invention*

Yunhao Ge, Shangze Yang, Zheng Zhang, Weixin Yan, Yanzheng Zhao CN201610712048 — *Jan. 2017*