Yunhao(Andy) Ge

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Education

University of Southern California *Los Angeles, USA*

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

- 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 more Human-centric and Humanoid AI. My current research focuses include:

1) **Causal Explainable AI** : (1) Understanding reasoning logic and causality of Neural Networks (NN) (2) Use explanation as feedback to help improve the performance of the original NN.

2) **Interpretable human-AI interaction** : understanding AI models beyond accuracy, such as disentangled representation learning, human-NN knowledge exchange, steerability, generalization, fairness, and bias.

3) **Humanoid Neural Network**: simulating human cognitive ability (Imagination, Reasoning, Visual Recognition) by using various learning algorithms (Generative models, Representation Learning, Graph Neural Network, Contrastive Learning, etc.).

4) **Effortless AI**: how generative models reduce human effort and boost discriminative models.

Selected Publications

[1] 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.*

[2] 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.*

[3] 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.*

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

Yunhao Ge, Jiaping Zhao, Laurent Itti PDF **Code**

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

[5] 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.*

[6] 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.*

[7] 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.*

[8] 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]

[9] A Real-time Gesture Prediction System Using Neural Networks and Multimodal Fusion based on Data Glove

Yunhao Ge, Bin Li, Weixin Yan, Yanzheng Zhao PDF Paper Link

*IEEE International Conference on Advanced Computational Intelligence (**ICACI**), 2018. [oral]*

[10] HH-Net: Image driven microscope fast auto-focus with deep neural network

Yunhao Ge, Bin Li, Yanzheng Zhao, Weixin Yan PDF

*International Conference on Biomedical Engineering and Technology (**ICBET**), 2019. [oral]*

[11] Melanoma Segmentation and Classification in Clinical Images Using Deep Learning

Yunhao Ge, Bin Li, Weixin Yan PDF Paper Link

*ACM International Conference on Machine Learning and Computing (**ICMLC**), 2018. [oral]*

[12] Benign and Malignant Mammographic Image Classification Based on Convolutional Neural Networks

Bin Li, **Yunhao Ge**, Yanzheng Zhao, Enguang Guan, Weixin Yan PDF Paper Link

*ACM International Conference on Machine Learning and Computing (**ICMLC**), 2018. [oral]*

Intern & Work Experience

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

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** *Aug. 2017*
(Responsible for the design of electronic control in robotics)
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*