

Yunhao Ge

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Education

University of Southern California

PhD, ilab, Computer Science Department

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

Los Angeles, USA

Aug. 2019 - Present

Shanghai Jiao Tong University

MASTER OF SCIENCE, Robotics and Intelligence Group, Robotics Institute

- Overall **Ranking 6th/210** | GPA: Mechanical 3.43/4 | Computer science courses 3.80/4
- Advisor: Prof. Weixin Yan & Prof. Hongtao Lu & 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** | GPA: Overall: 86.08/100 | Major: 93.38/100
- Honor: Outstanding Undergraduate Thesis Award

Jinan, China

Sep. 2012 - June 2016

Research Interests

My research interests broadly include Deep Learning, Reinforcement Learning, Computer vision and Robotics. Currently, I am focusing on interdisciplinary researches by using representation learning and adversarial learning for object recognition.

Publications

[1] 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.

[2] 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]

[3] 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]

[4] 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]

[5] 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]

[6] 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]

[7] Effect of Mechanical Error on Dual-Wedge Laser Scanning System and Error Correction

Yunhao Ge, Jihao Liu, Fenfen Xue, Enguang Guan, Weixin Yan, Yanzheng Zhao [PDF](#) [Paper Link](#)
Applied Optics (Appl. Opt. IF:1.79) 57, pp. 6047-6054, 2018

Research Projects

Robotics adaptive massage based on human pose detection and tracking

Flexiv Robotics

Advisor: [Cewu Lu](#), Shuyun Chong

May 2019 - Aug. 2019

- Proposed a lightweight local human 3D pose detection framework with an RGB-D camera, which achieved 10 fps on Nvidia-Tx2.
- Proposed a vision-based detection and tracking algorithm cooperating with robot force feedback for adaptive massage.

Unpaired Whole-body Cross Modality Medical Image Synthesis

United Image Intelligence

Advisor: [Dinggang Shen](#), Shu Liao

June 2018 - Nov. 2018

- Proposed an explicit structural constrained adversarial learning method to improve both the realistic and precise of the synthesized images which were unique to cross-modality medical image mapping
- Designed a novel correlation coefficient loss, which directly constrained the structural similarity between the input Magnetic Resonance (MR) and synthesized Computed Tomography (CT) image, to solve the mismatch of anatomical structures in synthesized CT images
- Developed a shape discriminator to incorporate the shape consistency information by extracting shape masks from two modality images to improve the synthesis quality. Gained substantial quality improvement especially in the surface shape and bone in whole body image mapping and reduce the Mean absolute error (MAE) from 107.03 to 78.34

Automatic focusing and global precise imaging of pathological microscope

Shanghai Jiao Tong University

Advisor: [Weixin Yan](#), Yanzheng Zhao, Huanhua Liao

June 2018 - June. 2019

- Achieved automatic target localization, customization of scanning path, automatic focusing, defocus image restoration, automatic stitching of global imaging and other automated processing in the process of full slice scanning diagnosis of microscopy
- Designed a novel micro image sharpness evaluation algorithm based on convolution neural network and driven the focusing motor to make precise automatic focusing on slice scanning.
- Proposed a large-scale fast mosaic algorithm based on feature matching, improving the accuracy and efficiency of large-scale image stitch

Automatic Detection and Segmentation of Colorectal Tumor in Medical Image

Shanghai Jiao Tong University

Advisor: [Hongtao Lu](#), [Weixin Yan](#), Huanhua Liao

Jan. 2018 - July 2018

- Proposed a Co-prediction learning method which combining multimodality Magnetic Resonance (MR) images and using complementary decision algorithms to imitate the diagnostic process of doctors to improve image-level detection accuracy
- Embedded two parallel prediction algorithms in the Co-prediction method that combined the advantage of the neural network's high-level feature learning ability and the statistical and handcraft feature selection ability of XGBoost
- Fused multimodality MR images (T1 weighted, T2 weighted and Diffusion Weighted Imaging) by models in a comprehensive view and achieved the colorectal tumor detection accuracy improved from 88% to 92% as well as the segmentation AP from 0.4 to 0.7

Real-time Gesture Prediction on Medical Robotics

Shanghai Jiao Tong University

Advisor: [Weixin Yan](#), Huanhua Liao

Nov. 2017 - Mar. 2018

- Proposed a real-time gesture prediction system achieving 99.9% accuracy in judging the intention of hand motion and predicting the exact final gesture before the end of hand movement
- Combined Position, Velocity, Acceleration and the Adjacent finger-coupling feature information as well as fused neural network and multiclass support vector machine (SVM) to make a multi-level decision which shortened the reaction time in 0.23 ms

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

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

Yunhao Ge, Shangze Yang, Zheng Zhang, Weixin Yan, Yanzheng Zhao CN201610712048

Patent for invention

Jan. 2017