Yunhao 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*

- 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(expected)*

- 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

Shandong University *Jinan, China*

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

- Overall **Ranking 1st/66** | GPA: Overall: 86.08/100 | Major: 93.38/100
- Honor: Outstanding Undergraduate Thesis Award

Research Interests

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

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. (accepted)*

[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 (accepted) [oral]

[3] Automatic Detection and Segmentation of Colorectal Tumor based on Multimodality Magnetic Resonance Imaging Fusion and Co-predictive Learning

Yunhao Ge, Bin Li, Weixin Yan PDF

*Medical Image Analysis (**MedIA IF:5.35**) (under review)*

[4] 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]*

[5] 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]*

[6] 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]*

[7] 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]*

[8] 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

Unpaired Whole-body Cross Modality Medical Image Synthesis

United Image Intelligence

Advisor: Dinggang Shen, Huanhua 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

Unpaired Whole-body Cross Modality Medical Image Synthesis

United Image Intelligence

Advisor: Dinggang Shen, Huanhua 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 Detection and Segmentation of Colorectal Tumor in Medical Image

Shanghai Jiao Tong University

Advisor: Hongtao Lu, Weixin Yan — *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

Classification and Segmentation: Deep Learning-based Computer-Aided Diagnosis on melanoma images and mammographic images

Shanghai Jiao Tong University

Advisor: Hongtao Lu, Weixin Yan — *Mar. 2017 - Dec. 2017*

- Proposed a computer-aided diagnosis system (CADs) consisting of a fully convolutional neural network (FCN) and a specific convolutional neural network (CNN) to combine high-level features with the DLCM features, statistical and contrast location features for automatic segmentation and classification of melanoma lesions
- Built four CNN models to study the impact of depth and hidden layer structure on model performance and achieved a balance of high sensitivity (90.63%) and high specificity (87.67%), improved accuracy from 86.7% to 89.05% in breast cancer diagnosis.

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*