Yunhao Ge

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Education

Shanghai Jiao Tong University   *Shanghai, China*
MASTER OF SCIENCE, Robotics and Intelligence Group, Robotics Institute   *Sep. 2016 - Jun. 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 - Jun. 2016*
- Overall **Ranking 1st/66** | GPA: Overall: 86.08/100 | Major: 93.38/100
- Honor: Outstanding Undergraduate Thesis Award

Research Interests

I'm broadly interested in Machine learning, Deep Learning, and Medical Image Analysis. My current research focus on interdisciplinary researches at Deep Learning and Medical Image Analysis.

Publications

[1] Unpaired Whole-body MR to CT Synthesis with Correlation Coefficient Constrained Adversarial Learning

Yunhao Ge, Zhong Xue, Tuoyu Cao, Shu Liao 📄 PDF

SPIE-Medical Imaging, 2019 (accepted) [oral]

[2] Unpaired MR to CT Synthesis with Explicit Structural Constrained Adversarial Learning

Yunhao Ge[*], Dongming Wei[*], Zhong Xue, Qian Wang, Shu Liao (*=equal contribution) 📄 PDF

*IEEE International Symposium on Biomedical Imaging (**ISBI**), 2019. (under review)*

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

Yunhao Ge, Zhong Xue, Tuoyu Cao, Shu Liao 📄 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**, Enguang Guan, Weixin Yan, Yanzheng Zhao 📄 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*

[8] Dynamic Drive Performances of the Bionic Suction Cup Actuator Based on Shape Memory Alloy

Yunhao Ge, Jihao Liu, Bin Li, Huihua Miao, Weixin Yan, Yanzheng Zhao 📄 PDF 📄 Paper Link

*International Conference on Intelligent Robotics and Applications (**ICIRA**), 2017. [oral]*

Research Projects

Unpaired Whole-body Cross Modality Medical Image Synthesis

United Image Intelligence &
UNC at Chapel Hill (remote)

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 - Jul. 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

2017	**National Scholarship (Graduate),** top graduate nationwide	*Shanghai, China*
2015	**National Scholarship (UnderGraduate),** top undergraduate nationwide	*Jinan, China*
2018	**KaiYuan Motivational Scholarship,** top 0.5% in Shanghai Jiao Tong University	*Shanghai, China*
2015	**Presidential Scholarship,** top 0.2% in Shandong University	*Jinan, China*
2015	**BaoGang Excellent student Scholarship,** 4 Places per year at Shandong University	*Jinan, China*
2013-2015	**First Prize Scholarship,** three-year continuous	*Jinan, China*

CONTESTS

Aug 2017	**The first prize,** 2017 ROBOMASTER **The World's Leading Robotics Competition** (Responsible for the design of electronic control in robotics)	*Shenzhen, China*
Dec 2017	**Rank 1st (preliminary competition),** Tianchi: Precision medical competition-Artificial Intelligence Aided genetic risk prediction of diabetes ⨀Pred-diabetes	*Shanghai, China*
Oct 2015	**The first prize,** 9th International college students Ican innovation and entrepreneurship competition	*Beijing, China*

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

Patent for invention

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

Jan. 2017