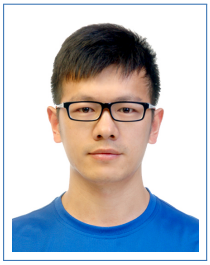
Youbao Tang

SENIOR RESEARCHER II

PAII Inc.
6720B Rockledge Drive Suite 410
Bethesda, MD 20817, USA
(1) (240)899-8968
tybxiaobao@gmail.com
https://tangyoubao.github.io/



Education and Job

Jun. 2020 –Present **Senior Research Scientist II**, *PAII Inc.*, Bethesda, MD, USA.
Doing researches and making products on using deep learning for medical imaging and clinical informatics.

Jun. 2017 –Jun. 2020 **Postdoctoral Research Fellow**, *National Institutes of Health (NIH)*, Bethesda, MD, USA.
Mentor: Dr. Ronald M. Summers and Dr. Le Lu.
Doing researches on large-scale medical imaging analysis using deep learning.

Sep. 2011 –Dec. 2016 **Doctor of Computer Applied Technology**, *Harbin Institute of Technology (HIT)*, China, *Recommendation*.
Supervisor: Prof. Xiangqian Wu
Thesis: Research on Visual Saliency Detection Method and Its Application

Sep. 2009 –Jul. 2011 **Master of Computer Science and Technology**, *Harbin Institute of Technology (HIT)*, China, *Recommendation*.
Supervisor: Prof. Xiangqian Wu
Thesis: Research on Encryption and Decryption Algorithm based on Non-contact Palmprint Feature

Sep. 2005 –Jul. 2009 **Bachelor of Bioinformatics**, *Harbin Institute of Technology (HIT)*, China, *Top 20%*.
Supervisor: Prof. Xiangqian Wu
Thesis: Keystroke-based User Identification and Verification

Research Interests

MEDICAL IMAGE ANALYSIS: Using Deep Learning for Medical Imaging and Clinical Informatics

PATTERN RECOGNITION: Writer Identification, Palmprint Recognition

COMPUTER VISION: Visual Saliency Detection, Scene Text Detection

Publications

Google scholar citations: 1032; h-index: 21. (2021-07-01)

⋆ indicates equal contribution, interns under my mentoring/co-mentoring.

BOOK CHAPTERS

46 Sicheng Zhao, Quanwei Huang, **Youbao Tang**, Xingxu Yao, Jufeng Yang, Guiguang Ding, Björn W. Schuller, "Computational Emotion Analysis From Visual Content: Recent Advances and Future Directionss", *Human Perception of Visual Information Psychological and Computational Perspective*, 2021.

JOURNALS

45 **Youbao Tang**, Yuxing Tang, Yingying Zhu, Jing Xiao, Ronald M. Summers, "A Disentangled Generative Model for Disease Decomposition in Chest X-rays via Normal Image Synthesis", ***Medical Image Analysis***, 67:101839, 2021.

44 Yuxing Tang, **Youbao Tang**, Yifan Peng, Ke Yan, Mohammadhadi Bagheri, Bernadette A. Redd, Catherine J. Brandon, Zhiyong Lu, Mei Han, Jing Xiao, Ronald M. Summers, "Automated Abnormality Classification of Chest Radiographs Using Deep Convolutional Neural Networks", ***NPJ Digital Medicine***, 3(1):1-8, 2020.

43 Ke Yan, Jinzheng Cai, Youjing Zheng, Adam P. Harrison, Dakai Jin, **Youbao Tang**, Yuxing Tang, Lingyun Huang, Jing Xiao, Le Lu, "Learning from Multiple Datasets with Heterogeneous and Partial Labels for Universal Lesion Detection in CT", ***IEEE Transactions on Medical Imaging***, 2020.

42 **Youbao Tang**, Xiangqian Wu, "Salient Object Detection Using Cascaded Convolutional Neural Networks and Adversarial Learning", ***IEEE Transactions on Multimedia***, 21(9):2237-2247, 2019.

41 **Youbao Tang**, Xiangqian Wu, "Scene Text Detection using Superpixel based Stroke Feature Transform and Deep Learning based Region Classification", ***IEEE Transactions on Multimedia***, 20(9):2276-2288, 2018.

40 Sicheng Zhao, Guiguang Ding, Yue Gao, Xin Zhao, **Youbao Tang**, Jungong Han, Qingming Huang, "Discrete Probability Distribution Prediction of Image Emotions With Shared Sparse Learning", ***IEEE Transactions on Affective Computing***.

39 **Youbao Tang**, Xiangqian Wu, "Scene Text Detection and Segmentation via Cascaded Convolution Neural Networks", ***IEEE Transactions on Image Processing***, 26(3):1509-1520, 2017.

38 **Youbao Tang**, Xiangqian Wu, Wei Bu, "Scene Text Detection Based on Multi-Level MSER", *Journal of Zhejiang University (Engineering Science)*, 50(6):1134-1140, 2016. (Chinese)

37 **Youbao Tang**, Xiangqian Wu, Wei Bu, "Offline Signature Verification Based on ASIFT", *Journal of Beijing University of Aeronautics and Astronautics*, 41(1):110-116, 2015. (Chinese)

36 Xiangqian Wu (Supervisor), **Youbao Tang**, Wei Bu, "Offline Text-Independent Writer Identification Based on Scale Invariant Feature Transform", ***IEEE Transactions on Information Forensics and Security***, 9(3):526-536, 2014.

CONFERENCES

35 **Youbao Tang**, Jinzheng Cai, Ke Yan, Lingyun Huang, Guotong Xie, Jing Xiao, Jingjing Lu, Gigin Lin, Le Lu, "Weakly-Supervised Universal Lesion Segmentation with Regional Level Set Loss", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2021. **[Early accept]**

34 **Youbao Tang**, Ke Yan, Jinzheng Cai, Lingyun Huang, Guotong Xie, Jing Xiao, Jingjing Lu, Gigin Lin, Le Lu, "Lesion Segmentation and RECIST Diameter Prediction via Click-driven Attention and Dual-path Connection", *International Conference on Medical Image Computing & Computer Assisted Intervention* ***(MICCAI)***, 2021.

33 Jieneng Chen, Ke Yan, Yu-Dong Zhang, **Youbao Tang**, Xun Xu, Shuwen Sun, Qiuping Liu, Lingyun Huang, Jing Xiao, Alan L Yuille, Ya Zhang, Le Lu, "Sequential Learning on Liver Tumor Boundary Semantics and Prognostic Biomarker Mining", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)* **[Student Travel Award]**, 2021.

32 Jinzheng Cai, **Youbao Tang**, Ke Yan, Adam P. Harrison, Jing Xiao, Gigin Lin, Le Lu, "Deep Lesion Tracker: Monitoring Lesions in 4D Longitudinal Imaging Studies", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.

31 Ke Yan, **Youbao Tang**, Adam P Harrison, Jinzheng Cai, Le Lu, Jingjing Lu, "Interpretable Medical Image Classification with Self-Supervised Anatomical Embedding and Prior Knowledge", *International Conference on Medical Imaging with Deep Learning (MIDL)*, 2021.

30 **Youbao Tang**, Yuxing Tang, Yingying Zhu, Jing Xiao, Ronald M. Summers, "E^2Net: An Edge Enhanced Network for Accurate Liver and Tumor Segmentation on CT Scans", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2020. **[Early accept]**

29 **Youbao Tang**, Ke Yan, Jing Xiao, Ronald M. Summers, "One Click Lesion RECIST Measurement and Segmentation on CT Scans", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2020. **[Early accept]**

28 Yingying Zhu, **Youbao Tang**, Yuxing Tang, Daniel Elton, Sungwon Lee, Perry Pickhardt, Ronald M. Summers, "Cross-Domain Image Translation by Shared Latent Gaussian Mixture Model", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2020.

27 Vatsal Agarwal*, **Youbao Tang***, Jing Xiao, Ronald M. Summers, "Weakly-Supervised Lesion Co-Segmentation on CT Scans", *IEEE International Symposium on Biomedical Imaging (ISBI)* **[Oral]**, 2020.

26 Vatsal Agarwal*, **Youbao Tang***, Jing Xiao, Ronald M. Summers, "Weakly-Supervised Lesion Segmentation on CT Scans Using Co-Segmentation", *SPIE Medical Imaging* **[Oral]**, 2020.

25 Jia Liang*, Yuxing Tang*, **Youbao Tang**, Jing Xiao, Ronald M. Summers, "Bone Suppression on Chest Radiographs with Adversarial Learning", *SPIE Medical Imaging* **[Oral]**, 2020.

24 Yuxing Tang, **Youbao Tang**, Veit Sanfort, Jing Xiao, Ronald M. Summers, "TUNA-Net: Task-oriented UNsupervised Adversarial Network for Disease Recognition in Cross-Domain Chest X-rays", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2019.

23 Ke Yan, **Youbao Tang**, Yifan Peng, Veit Sanfort, Mohammadhadi Bagheri, Zhiyong Lu, Ronald M. Summers, "MULAN: Multitask Universal Lesion Analysis Network for Joint Lesion Detection, Tagging, and Segmentation", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2019.

22 **Youbao Tang***, Yuxing Tang*, Jing Xiao, Ronald M. Summers, "XLSor: A Robust and Accurate Lung Segmentor on Chest X-Rays Using Criss-Cross Attention and Customized Radiorealistic Abnormalities Generation", *International Conference on Medical Imaging with Deep Learning (MIDL)*, 2019.

21 **Youbao Tang**, Ke Yan*, Yuxing Tang*, Jiamin Liu*, Jing Xiao, Ronald M. Summers, "ULDor: A Universal Lesion Detector for CT Scans with Pseudo Masks and Hard Negative Example Mining", *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2019.

20 Yuxing Tang, **Youbao Tang**, Mei Han, Jing Xiao, Ronald M. Summers, "Abnormal Chest X-ray Identification with Generative Adversarial One-Class Classifier", *IEEE International Symposium on Biomedical Imaging (ISBI)* **[Oral & Travel Award]**, 2019.

19 **Youbao Tang***, Sooyoun Oh*, Yuxing Tang, Jing Xiao, Ronald M. Summers, "CT-Realistic Data Augmentation Using Generative Adversarial Network for Robust Lymph Node Segmentation", *SPIE Medical Imaging*, 2019.

18 Yuxing Tang, **Youbao Tang**, Mei Han, Jing Xiao, Ronald M. Summers, "Deep Adversarial One-class Learning for Normal and Abnormal Chest Radiograph Classification", *SPIE Medical Imaging* **[Oral]**, 2019.

17 **Youbao Tang***, Jinzheng Cai*, Le Lu, Adam P. Harrison, Ke Yan, Jing Xiao, Lin Yang, Ronald M. Summers, "CT Image Enhancement Using Stacked Generative Adversarial Networks and Transfer Learning for Lesion Segmentation Improvement", *International Conference on Machine Learning in Medical Imaging (MICCAI-MLMI)* **[Oral]**, 2018.

16 **Youbao Tang**, Adam P. Harrison, Mohammadhadi Bagheri, Jing Xiao, Ronald M. Summers, "Semi-Automatic RECIST Labeling on CT Scans with Cascaded Convolutional Neural Networks", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2018.

15 Jinzheng Cai*, **Youbao Tang***, Le Lu, Adam P. Harrison, Ke Yan, Jing Xiao, Lin Yang, Ronald M. Summers, "Accurate Weakly-Supervised Deep Lesion Segmentation using Large-Scale Clinical Annotations: Slice-Propagated 3D Mask Generation from 2D RECIST", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2018.

14 Dakai Jin, Ziyue Xu, **Youbao Tang**, Adam P. Harrison, Daniel Mollura, "CT-Realistic Lung Nodule Simulation from 3D Conditional Generative Adversarial Networks for Robust Lung Segmentation", *International Conference on Medical Image Computing & Computer Assisted Intervention (**MICCAI**)*, 2018.

13 **Youbao Tang**, Xiangqian Wu, "Salient Object Detection with Chained Multi-scale Fully Convolutional Network", *ACM Multimedia Conference (**ACMMM**)*, 2017.

12 **Youbao Tang**, Xiangqian Wu, "Saliency Detection via Combining Region-level and Pixel-level Predictions with CNNs", *European Conference on Computer Vision (**ECCV**)*, 2016.

11 **Youbao Tang**, Xiangqian Wu, Wei Bu"Deeply-Supervised Recurrent Convolutional Neural Network for Saliency Detection", *ACM Multimedia Conference (**ACMMM**)*, 2016.

10 **Youbao Tang**, Xiangqian Wu, "Scene Text Detection via Edge Cue and Multi-Features", *International Conference on Frontiers in Handwriting Recognition (ICFHR)*, 2016.

9 **Youbao Tang**, Xiangqian Wu, "Text-independent Writer Identification via CNN Features and Joint Bayesian", *International Conference on Frontiers in Handwriting Recognition (ICFHR)* **[Oral]**, 2016.

8 **Youbao Tang**, Xiangqian Wu, Wei Bu, "Saliency Detection Based on Graph-Structural Agglomerative Clustering", *ACM Multimedia Conference (**ACMMM**)*, 2015.

7 **Youbao Tang**, Xiangqian Wu, Wei Bu, "Text Line Segmentation Based on Matched Filtering and Top-down Grouping for Handwritten Documents", *International Workshop on Document Analysis Systems (DAS)*, 2014.

6 **Youbao Tang**, Wei Bu, Xiangqian Wu, "Text-Independent Writer Identification Using Improved Structural Features", *Chinese Conference on Biometric Recognition (CCBR)*, 2014.

5 **Youbao Tang**, Xiangqian Wu, Wei Bu, "Offline Text-independent Writer Identification Using Stroke Fragment and Contour Based Features", *International Conference on Biometrics (ICB)*, 2013.

4 **Youbao Tang**, Xiangqian Wu, Wei Bu, Hongyang Wang, "Skew Estimation in Document Images Based on an Energy Minimization Framework", *International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV)*, 2013.

3 Wei Bu, Qiushi Zhao, Xiangqian Wu, **Youbao Tang**, "A Novel Contactless Multimodal Biometric System Based on Multiple Hand Features", *International Conference on Hand-Based Biometrics (ICHB)*, 2011.

2 Xin Cui, Qiushi Zhao, Xiangqian Wu, **Youbao Tang**, "A Contactless Hand Shape Identification System", *International Conference on Advanced Computer Control (ICACC)*, 2011.

1 Xiangqian Wu, Enying Gao, **Youbao Tang**, Kuanquan Wang, "A Novel Biometric System Based on Hand Vein", *International Conference on Frontier of Computer Science and Technology (FCST)*, 2010.

Clinical Abstracts

12 **Youbao Tang**, et al., "Accurate Weakly-supervised Volumetric Universal Lesion Segmentation Using Large-scale Clinical RECIST Diameter Annotations And Regional Level Set Loss", *The Radiological Society of North America (**RSNA**)* [**Oral**], 2021.

11 **Youbao Tang**, et al., "Automatic RECIST Measurement In Longitudinal CT Imaging Studies", *The Radiological Society of North America (**RSNA**)* [**Oral**], 2021.

10 **Youbao Tang**, et al., "Automatically, Precisely, And Comprehensively Measuring Tumor Sizes With Minimal Human Effort", *The Radiological Society of North America (**RSNA**)*, 2021.

9 Lianyan Xu, Ke Yan, Kai Cao, Ling Zhang, Jingjing Lu,Weihong Zhang, Jinzheng Cai, **Youbao Tang**, et al., " Multi-organ Universal Lesion Detection In CT Scans: An Independent External Validation", *The Radiological Society of North America (**RSNA**)* [**Oral**], 2021.

8 **Youbao Tang**, et al., "One Click Guided Automatic RECIST Lesion Measurement and Segmentation on CT Scans", *The Radiological Society of North America (**RSNA**)* [**Oral & Featured Paper & RSNA Trainee Research Prize**], 2020.

7 **Youbao Tang**, et al., "Accurate Liver and Tumor Segmentation on CT Scans Using an Edge-enhanced Network", *The Radiological Society of North America (**RSNA**)* [**Oral**], 2020.

6 **Youbao Tang**, et al., "Making RECIST Measurements Easy: A Semi-Automated Deep Learning System With Expert-Equivalent Accuracy and Better Consistency", *The Radiological Society of North America (**RSNA**)* [**Oral**], 2020.

5 **Youbao Tang**, et al., "An Interpretable Generative Model for Chest X-ray Decomposition via Synthesizing Radio-realistic Normal Chest X-rays and Separating Abnormalities", *The Radiological Society of North America (**RSNA**)*, 2019.

4 Yuxing Tang, **Youbao Tang**, et al., "Abnormal Chest X-ray Identification with Generative Adversarial One-Class Classifier", *The Radiological Society of North America (**RSNA**)* [**Oral & RSNA Trainee Research Prize**], 2019.

3 Ke Yan, **Youbao Tang**, et al., "MULAN: Multitask Universal Lesion Analysis Network for Joint Lesion Detection, Tagging, and Segmentation", *The Radiological Society of North America (**RSNA**)* [**Oral**], 2019.

2 **Youbao Tang**, et al., "Semi-Automatic RECIST Labeling on CT Scans with Cascaded Convolutional Neural Networks", *The Radiological Society of North America (**RSNA**)*, 2018.

1 **Youbao Tang***, Jinzheng Cai*, et al., "CT Image Enhancement Using Stacked Generative Adversarial Networks and Transfer Learning for Lesion Segmentation Improvement", *The Radiological Society of North America (**RSNA**)*, 2018.

Preprints

2 Ke Yan, Jinzheng Cai, Dakai Jin, Shun Miao, Adam P. Harrison, Dazhou Guo, **Youbao Tang**, Jing Xiao, Jingjing Lu, Le Lu, "Self-supervised Learning of Pixel-wise Anatomical Embeddings in Radiological Images", *arXiv preprint, arXiv:2012.02383*, 2020.

1 Jinzheng Cai*, **Youbao Tang***, Le Lu, Adam P. Harrison, Ke Yan, Jing Xiao, Lin Yang, Ronald M. Summers, "Accurate Weakly Supervised Deep Lesion Segmentation on CT Scans: Self-Paced 3D Mask Generation from RECIST", *arXiv preprint, arXiv:1801.08614*, 2018.

Patents

10 Jinzheng Cai, **Youbao Tang**, Ke Yan, Adam P. Harrison, Le Lu, "Deep Lesion Tracker for Monitoring Lesions in Four-Dimensional Longitudinal Imaging", USPTO Regular Patent Application, *US17/213,804*, 2021.

9 Ke Yan, Jinzheng Cai, **Youbao Tang**, Dakai Jin, Shun Miao, Le Lu, "Self-Supervised Learning of Pixel-Wise Anatomical Embeddings in Medical Images", USPTO Regular Patent Application, *US17/208,128*, 2021.

8 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Scene Text Detection Using Superpixel-based Stroke Feature Transform and Deep Learning based Region Classification", CN Patent, *201810103800.4*. Granted in 2021/06/01.

7 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Visual Saliency Detection based on Deeply-supervised Recurrent Convolutional Neural Network", CN Patent, *ZL 2016 1 0604722. 7*. Granted in 2020/11/10.

6 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Salient Object Detection with Chained Multi-Scale Fully Convolutional Network", CN Patent, *ZL 2017 1 0930183. 0*. Granted in 2020/04/03.

5 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Saliency based Scene Text Detection", CN Patent, *ZL 2016 1 1137890. 6*. Granted in 2019/06/04.

4 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Saliency Detection via Combining Region-Level and Pixel-Level Predictions with CNNs", CN Patent, *ZL 2016 1 0604732. 0*. Granted in 2018/11/02.

3 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Skew Estimation and Correction in Document Images Based on an Energy Minimization Framework", CN Patent, *ZL 2013 1 0321375. 3*. Granted in 2016/07/20.

2 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Writer Identification Using Stroke Fragment and Contour based Features", CN Patent, *ZL 2013 1 0225735. X*. Granted in 2016/03/23.

1 Xiangqian Wu, Wei Bu, **Youbao Tang**, "Salient Object Detection Using Cascaded Convolutional Neural Networks and Adversarial Learning", CN Patent Application, *201910024728.0*, 2019.

Research Experiences

Jun. 2020 –Present **PAII Inc.**

Universal Lesion Analysis in CT Images, Bethesda, MD, USA.

In this project, we defined and produced a universal lesion analysis product that can detect different kinds of lesions across various organs in the chest and abdomen on CT scans. As a groundbreaking product, it can be used for patients' comprehensive screening. We collaborated with several hospitals, achieved promising results on real clinical data, and received positive feedbacks from doctors.

Intelligent PACS Development, Bethesda, MD, USA.

In this project, we developed an intelligent PACS product to automate several processing steps (anatomical point matching, lesion tracking, measuring and segmenting) when doctors read CT scans, which are time-consuming and tedious. We have deployed this product to several hospitals and been working with several top PACS companies, so as to expand its clinical impacts and commercialize it.

Jun. 2017 –Jun. 2020 **Postdoc**

Lesion Detection, Segmentation, and RECIST Diameter Prediction on CT Scans, NIH, Bethesda, MD, USA.

Several deep learning based models were developed to tackle three important clinical applications of medical image analysis: universal lesion detection, segmentation and RECIST (response evaluation criteria in solid tumors) diameter prediction on CT scans. One work won the ***2020 RSNA Trainee Research Prize***, the best paper of informatics category. Another one won the ***2019 NIH Fellows Award of Research Excellence***. I also mentored two summer interns.

Disease Analysis in Chest X-Ray Images, NIH, Bethesda, MD, USA.

A series of deep learning based methods were proposed for different computer-aided diagnosis tasks in Chest X-Ray (CXR) images including disease classification and localization, CXR interpretation, and abnormal lung segmentation. They can handle the situation of lacking annotations of abnormal CXRs for training and deal with the domain shift problem. One work (second author) won the ***2019 RSNA Trainee Research Prize***.

Aug. 2011 –Dec. 2016 **Ph.D.**

Salient Object Detection and Segmentation, China.

Five approaches were proposed in this project, where one extracted hand-crafted features and employed graph-structural agglomerative clustering to detect the salient objects coarse-to-fine, and the other four were developed based on deep convolutional neural networks (CNN) and adversarial learning.

Scene Text Detection in Natural Images, China.

Four approaches were proposed in this project, where I used the text edge information, superpixel-based stroke feature transforms, and text-aware saliency detection to generate candidate text regions. Some hand-crafted low-level features and CNN-based deep high-level features were extracted and fused for region classification.

Offline Text-Independent Writer Identification, China.

Four approaches were proposed in this project, which focused on the extraction of discriminative features (including hand-crafted features and CNN-based features) identified in images of handwriting to represent identities and writing habits.

Signature Video Based Personal Recognition, China.

I drafted the project application. To verify its feasibility and effectiveness, I developed a tool for data collection, collected signature videos from over 60 people, applied image processing techniques to detect, segment, and track the hands and signatures, and extracted some behavior and identity related features for identification.

Aug. 2009 –Jul. 2011 **Master**

Contactless Identity Recognition by Integrating Hand Vein, Handprint, and Handshape, China.

I was in charge of the algorithm implementation and optimization and the whole system development. Also, I built an Android based palmprint identification App, which had been used for student checking-in in Prof. Wu's class. In this project, we comprehensively extracted features from hands for identification and verification that can represent our unique personal identity information.

Data Encryption and Decryption Based on Palmprint Features, China.
I was in charge of encryption and decryption algorithm research and system implementation. In this project, I generated long, complex, and irreversible sequences by encoding the features extracted from palmprint images to encrypt and decrypt data.

Awards

2020 RSNA 2020 Trainee Research Prize. (First author)
2019 RSNA 2019 Trainee Research Prize. (Second author)
2018 NIH Fellows Award of Research Excellence (FARE) 2019 competition.
2014 National Scholarship
2014 2^{nd} Price of the Third CCF Youth Internet Entrepreneurship Competition

Professional Services

Reviewer

IEEE Transactions on Pattern Analysis and Machine Intelligence
IEEE Transactions on Information Forensics and Security
IEEE Transactions on Neural Networks and Learning Systems
IEEE Transactions on Industrial Informatics
IEEE Transactions on Image Processing
IEEE Transactions on Medical Imaging
IEEE Transactions on Multimedia
IEEE Transactions on Circuits and Systems for Video Technology
IEEE Transactions on Very Large Scale Integration Systems
IEEE Transactions on Dependable and Secure Computing
IEEE Journal of Biomedical and Health Informatics
IEEE Access
Medical Image Analysis
Knowledge-Based Systems
Neurocomputing
Artificial Intelligence in Medicine
American Journal of Roentgenology
Journal of Experimental & Theoretical Artificial Intelligence
IET Image Processing
IET Biometrics
Journal of Electronic Imaging
Journal of Digital Imaging
International Journal of Distributed Sensor Networks

ICLR 2022, CVPR 2019/2020/2021(**Outstanding Reviewer**), ICCV 2019, ECCV 2020, AAAI 2020/2021, IJCAI 2021, MICCAI 2018/2019, ICME 2019, ICHI 2019, PRCV 2019

Talks

8 Universal Lesion Analysis in CT Images and Its Application in Intelligent PACS. *Synced AI*. Virtual, 2021-05-23.

7 One Click Guided Automatic RECIST Lesion Measurement and Segmentation on CT Scans. *RSNA Annual Meeting*. Virtual, 2020-12-01.

6 Making RECIST Measurements Easy: A Semi-Automated Deep Learning System With Expert-Equivalent Accuracy and Bet-ter Consistency. *RSNA Annual Meeting*. Virtual, 2020-12-03.

5 Accurate Liver and Tumor Segmentation on CT ScansUsing an Edge-enhanced Network. *RSNA Annual Meeting*. Virtual, 2020-12-04.

4 One Click Lesion RECIST Measurement and Segmentation on CT Scans. *International Conference on Medical Image Computing & Computer Assisted Intervention*. Virtual, 2020-10-06.

3 E^2Net: An Edge Enhanced Network for Accurate Liver and Tumor Segmentation on CT Scans. *International Conference on Medical Image Computing & Computer Assisted Intervention*. Virtual, 2020-10-06.

2 Deep Learning in Radiology: Applications in Lesion and Organ Segmentation. *NIH AI Workshop on Image Segmentation*. Bethesda, USA, 2019-02-14.

1 Text-independent Writer Identification via CNN Features and Joint Bayesian. *International Conference on Frontiers in Hand-writing Recognition*. Shenzhen, China, 2016-10-24.