

KE YAN

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EDUCATION

National Institutes of Health, US

Postdoc in Imaging Biomarkers and Computer-Aided Diagnosis Laboratory Jan 2017 till now

Advisor: Dr. Ronald M. Summers, Dr. Le Lu

Tsinghua University, Beijing, P.R. China

Ph.D. Electronic Engineering, advisor: Prof. David Zhang, *IEEE fellow* – Jul 2016

B.Eng. Electronic Engineering – Jul 2010

RESEARCH INTERESTS

Computer vision medical image analysis, deep learning, machine learning.

EXPERIENCES

Postdoc Project

January 2017 - Present

- I mined CT images and lesion annotations from PACS to build a large-scale and diverse database - DeepLesion. I have been developing lesion detection, retrieval, classification, and body-part recognition algorithms on the dataset using deep learning approaches.

Researcher in DeePhi Tech, China

August 2016 - November 2016

- I developed pedestrian detection algorithms with caffe using faster RCNN and region-based fully convolutional networks.

Ph.D. Project

September 2011 - June 2016

- An interdisciplinary topic: I developed a sensor system (an electronic nose) to measure breath biomarkers of human, then proposed several machine learning (transfer learning, classification, and regression) algorithms to analyze the signals for non-invasive disease diagnosis and monitoring.

Intern in IBM China Research Lab

July 2015 - August 2015

- I took part in developing a robot-based intelligent shopping assistant and wrote modules for speech recognition, text-to-speech, and movement by invoking public softwares and the APIs of the robot.

Intern in Xingke Intelligent Tech, China

July 2013 - August 2013

- I developed a real-time gesture recognition system on Unity3D, which reads skeleton data from Microsoft Kinect, then recognizes gestures using template matching and finite-state machine algorithms.

Undergraduate Research Project

March 2010 - August 2011

- I developed a face recognition system including geometry and illumination normalization, feature extraction, and subspace learning. The OpenCV-based program received over 10k downloads until 2014.

PUBLICATIONS

[Google Scholar](#): 353 citations till 04/11/2019

Peer-Reviewed Journals

- Ke Yan, Xiaosong Wang, Le Lu, Ronald M. Summers, “DeepLesion: Automated Mining of Large-Scale Lesion Annotations and Universal Lesion Detection with Deep Learning,” *J. Med. Imaging*, 2018.
- Ke Yan, Lu Kou, and David Zhang, “Learning Domain-Invariant Subspace Using Domain Features and Independence Maximization,” *IEEE Trans. on Cybernetics* (IF=4.943), Jan. 2017.
- Ke Yan, David Zhang, and Yong Xu, “Correcting Instrumental Variation and Time-Varying Drift Using Parallel and Serial Multitask Learning,” *IEEE Trans. on Instrumentation and Measurement (TIM)* (IF=2.456), Jun., 2017.
- Ke Yan and David Zhang, “Correcting instrumental variation and time-varying drift: A transfer learning approach with autoencoders,” *IEEE Trans. on Instrumentation and Measurement (TIM)* (IF=1.808), Sep., 2016.
- Ke Yan and David Zhang, “Calibration transfer and drift compensation of e-noses via coupled task learning,” *Sensors and Actuators B: Chemical* (IF=4.758), Mar., 2016.
- Ke Yan and David Zhang, “Improving the transfer ability of prediction models for electronic noses,” *Sensors and Actuators B: Chemical* (IF=4.758), Dec., 2015.
- Ke Yan and David Zhang, “Feature selection and analysis on correlated gas sensor data with recursive feature elimination,” *Sensors and Actuators B: Chemical* (IF=4.758), Jun., 2015.
- Ke Yan, David Zhang, Darong Wu, Hua Wei, and Guangming Lu, “Design of a breath analysis system for diabetes screening and blood glucose level prediction,” *IEEE Trans. on Biomedical Engineering* (IF=2.347), Nov., 2014.

Conference Proceedings

- Ke Yan, Yifan Peng, Veit Sandfort, Mohammadhadi Bagheri, Zhiyong Lu, and Ronald M. Summers, “Holistic and Comprehensive Annotation of Clinically Significant Findings on Diverse CT Images: Learning from Radiology Reports and Label Ontology,” *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2019, oral presentation.
- Ke Yan, Yifan Peng, Zhiyong Lu, Ronald M. Summers, “Fine-Grained Lesion Annotation in CT Images with Knowledge Mined from Radiology Reports,” *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2019, oral presentation, best paper finalist.
- 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,” *ISBI*, 2019.
- Ke Yan, X Wang, L Lu, L Zhang, A Harrison, M Bagheri, and R M Summers, “Deep Lesion Graphs in the Wild: Relationship Learning and Organization of Significant Radiology Image Findings in a Diverse Large-scale Lesion Database,” *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2018.
- Ke Yan, Mohammadhadi Bagheri, Ronald M. Summers, “3D Context Enhanced Region-based Convolutional Neural Network for End-to-End Lesion Detection,” *Intl. Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Granada, Spain, 2018.
- Ke Yan, Xiaosong Wang, Le Lu, Ling Zhang, Mohammadhadi Bagheri, Ronald M. Summers, “DeepLesion: a Diverse and Large-scale Database of Significant Radiology Image Findings,” *MICCAI workshop-Large-scale Annotation of Biomedical Data and Expert Label Synthesis (LABELS)*, spotlight, 2018.
- 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,” *MICCAI*, 2018.
- 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,” *MICCAI workshop-International Conference on Machine Learning in Medical Imaging (MLMI)*, oral, 2018.
- Ke Yan, Le Lu, and Ronald M. Summers, “Unsupervised Body Part Regression via Spatially Self-ordering Convolutional Neural Networks,” *IEEE Intl. Symposium on Biomedical Imaging (ISBI)*, oral presentation, 2018.

- Ke Yan et al., “Relationship Learning and Organization of Significant Radiology Image Findings for Lesion Retrieval and Matching,” Scientific Paper, **Trainee Research Prize**, *RSNA*, 2018.
- Ke Yan, Mohammadhadi Bagheri, Ronald M. Summers, “3D Context Enhanced Region-based Convolutional Neural Network for Universal Lesion Detection in a Large Database of 32,735 Manually Measured Lesions on Body CT,” *RSNA*, 2018.
- Youbao Tang et al., “CT Image Enhancement for Lesion Segmentation Using Stacked Generative Adversarial Networks,” *RSNA*, 2018.
- Xiaosong Wang*, Ke Yan*, Le Lu, and Ronald M. Summers, “DeepLesion: Automated Deep Mining, Categorization and Detection of Significant Radiology Image Findings using Large-Scale Clinical Lesion Annotations,” scientific poster, *Annual Meeting of Radiology Society of North America (RSNA)*, Chicago, 2017.
- Ke Yan and David Zhang, “Blood glucose prediction by breath analysis system with feature selection and model fusion,” in *36th Annual Intl. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC)*, oral presentation, Chicago, 2014.
- Ke Yan and David Zhang, “Sensor evaluation in a breath analysis system,” in *Intl. Conf. on Medical Biometrics (ICMB)*, oral presentation, Shenzhen, 2014.
- Yujing Ning, Guangming Lu, Ke Yan, and Xia Zhang, “Standardization of gas sensors in a breath analysis system,” in *9th Chinese Conf. on Biometric Recognition*, oral presentation, 2014.
- Ke Yan and David Zhang, “A novel breath analysis system for diabetes diagnosis,” in *Intl. Conf. on Computerized Healthcare*, oral presentation, Hong Kong, China, 2012.
- Ke Yan, Youbin Chen, and David Zhang, “Gabor surface feature for face recognition,” in *First Asian Conf. on Pattern Recognition (ACPR)*, oral presentation, Beijing, 2011.

Books

- David Zhang, Dongmin Guo, and Ke Yan, “Breath Analysis for Medical Applications,” Springer, 2017.

For more details of the papers, please visit <http://yanke23.com/research/>.

AWARDS

- Winner of 2018 Radiological Society of North America (RSNA) Trainee Research Prize.
- Winner of the 2016 Tsinghua University Excellent Doctoral Dissertation Award.
- First prize of Tsinghua Outstanding Scholarship, 2 times (school-level, 2014, 2015);
- First prize of Foxconn Scholarship, 2 times (college-level, 2012, 2013);
- Most Creative Award in the First Photo Contest of University Town of Shenzhen.
- Best Intern Demonstration Award in IBM China Research Lab.

ACTIVITIES

- Invited talks: MICCAI 2018 Workshop of Computational Precision Medicine; NIH Research Festival; CVPR 2018 Medical Computer Vision and Health Informatics Workshop.
- My work of DeepLesion was reported by [NIH](#), [SPIE](#), [American Association for Cancer Research](#), and many other news websites.
- My paper “Unsupervised Body Part Regression via Spatially Self-ordering Convolutional Neural Networks” was featured in the RSIP Vision and ISBI Daily in cooperation with Computer Vision News.