Lin Dongyun

Ph.D.

10 Hillview Rise, #12-13, 667972
Singapore
+6584342859
https://thomaslin1990.github.io
lind@i2r.a-star.edu.sg

Education

2014–2018 **PhD Electrical & Electronic Engineering**, *Nanyang Technological University, School of Electrical and Electronic Engineering*, Singapore

Ph.D. Thesis Title: Robust Classification and Detection with Applications in Biomedical Images

2009–2013 **BSc Information and Electronic Engineering**, *Beijing Institute of Technology, School of Information and Electronic*, Beijing, China

BSc Thesis Title: Improvement on the Performance of Wireless Transmission Based on 802.11n

Work Experience

2023–Now **Senior Scientist**, *Institute for Infocomm Research (I^2R), Agency for Science, Technology and Research (A*STAR)*, Singapore

2018–2023 **Scientist**, *Institute for Infocomm Research (I^2R), Agency for Science, Technology and Research (A*STAR)*, Singapore

Industry and Research Projects

2021–2024 **Industry Project on Automatic Workflow Tracing and Optimization for Prescriptive MRO (I^2R, A*STAR)**

Responsibility As the technical lead, implement and evaluate a large-scale information retrieval digital platform to efficiently organize mechanical components.

2018–2019 **Industry Project on Multimodal Bicycle Parking Place Identification for Shared-bicycle Parking Enforcement (I^2R, A*STAR and LTA)**

Responsibility As the technical lead, design and implement a bicycle parking scene understanding system based on deep learning.

2019–2020 **Industry Project on Masked Face Detection and Recognition (I^2R, A*STAR)**

Responsibility As the technical lead, design and implement an effective face detection and recognition system for masked faces.

2020–2022 **Researches on Few-Shot Industrial Anomaly/Defect Detection and Segmentation(I^2R, A*STAR)**

Responsibility Conduct extensive researches on industrial anomaly/defect detection and segmentation with limited number of training data.

2021–2024 **Researches on Deep Learning based Multi-Modal 3D Object Recognition and Retrieval (I^2R, A*STAR)**

Responsibility Conduct extensive researches on 3D object retrieval based on CNN, Vision Transformer and Large Vision-Language Model.

2014–2018 **Researches on Robust Classification and Detection with Applications in Biomedical Images (Ph.D. Thesis)**

Responsibility Conduct researches on robust classification and detection on biomedical images via computer vision and deep learning based approaches.

2017 **Researches on Automated Detection of Ring-like Endosomal Structures from Microscopy Images (part of Ph.D. work, cooperating with Ward Ober Lab, Texas A&M University, U.S.A)**

Responsibility Propose and implement a system to detect and localize ring-like endosome structures from microscopy images

2015 **Researches on Automated Classification of Parasites from Microscopy Images Captured from a Microfluid System (part of Ph.D. work)**

Responsibility Design and implement a machine learning system to automatically detect Crypto and Giardia from drinking water through microscopy images captured by a microfluid system

Research Interests

MACHINE LEARING COMPUTER VISION

- Computer Vision
- Deep Learning
- Statistical Machine Learning
- Biomedical Image Analysis

Skills

PROGRAMING Proficient in Python, Matlab, C, Deep Learning Framework Pytorch

COMMUNICATIONS English: proficient in speaking and writing. Chinese: mother tongue.

Qualification Certificates

- Tensorflow in Practice (Coursera, No.: XBDLSAU2J2HR)
- Deep Learning Specializtion (Coursera, No.: 6XAV5EPVH837)

Teaching Experience

Tutor

2016–2017 **Signal and System**, *EE2010*, School of E.E.E, NTU, Singapore

Lab Teaching Assistant

2016–2017 **Signal and system**, *EE2010L*, School of E.E.E, NTU, Singapore

Supervisor of Graduate Internship Students

2021–2022 **Topic: Research on identifying industry components using multi-view deep learning models**, I2R, A*STAR, Singapore

Mentor of Undergraduate Students

2016–2018 **Topic: Transfer learning for biomedical image classification using deep neural networks**, School of E.E.E, NTU, Singapore

2015–2016 **Topic: Automated segmentation of melasma from skin images**, School of E.E.E, NTU, Singapore

Awards

2021–2024 **Recipient of AI Niche Skill Allowance**, I^2R, A*STAR

2022 **1st Place in EPIC-Kitchens Dataset Challenges: Unsupervised Domain Adaptation for Action Recognition Track**, *CVPR2022*

2023 **1st Place in EPIC-Kitchens Dataset Challenges: Unsupervised Domain Adaptation for Action Recognition Track**, *CVPR2023*

2022 **Research Work on Defect Detection and Segmentation is shown in A*STAR Research Highlight**, *https://research.a-star.edu.sg/articles/highlights/a-smarter-way-to-detect-defects/*

2023 **Research Work on 3D object recognition is shown in A*STAR Research Highlight**, *https://research.a-star.edu.sg/articles/highlights/algorithms-give-computers-stereoscopic-vision/*

2014 **2018**, *NTU Research Scholarship (Ph.D.)*, NTU

Referees

1. Lin Zhiping (Assoc Professor of NTU, Singapore) Email: ezplin@ntu.edu.sg
2. Li Huiqi (Professor of Beijing Institute of Technology, Beijing, China) Email: huiqili@bit.edu.cn
3. Cao Yanpeng (Professor of Zhejiang University, Zhejiang, China) Email: caoyp@zju.edu.cn

Publications

[1] Dongyun Lin, Yi Cheng, Aiyuan Guo, Shangbo Mao, and Yiqun Li. SCA-PVNet: Self-and-cross attention based aggregation of point cloud and multi-view for 3D object retrieval. *Knowledge-Based Systems*, page 111920, 2024.

[2] Dongyun Lin, Yiqun Li, Yi Cheng, Shitala Prasad, Aiyuan Guo, and Yanpeng Cao. Multi-range view aggregation network with vision transformer feature fusion for 3D object retrieval. *IEEE Transactions on Multimedia*, 2023.

[3] Yi Cheng, Hehe Fan, Dongyun Lin, Ying Sun, Mohan Kankanhalli, and Joo-Hwee Lim. Keyword-aware relative spatio-temporal graph networks for video question answering. *IEEE Transactions on Multimedia*, 2023.

[4] Yanlong Cao, Wenbin Zhu, Jiangxin Yang, Guizhong Fu, Dongyun Lin, and Yanpeng Cao. An effective industrial defect classification method under the

few-shot setting via two-stream training. *Optics and Lasers in Engineering*, 161:107294, 2023.

[5] Dongyun Lin, Yiqun Li, Yi Cheng, Shitala Prasad, Tin Lay Nwe, Sheng Dong, and Aiyuan Guo. Multi-view 3d object retrieval leveraging the aggregation of view and instance attentive features. *Knowledge-Based Systems*, page 108754, 2022.

[6] Shitala Prasad, Yiqun Li, Dongyun Lin, Sheng Dong, and Ma Tin Lay Nwe. A progressive multi-view learning approach for multi-loss optimization in 3d object recognition. *IEEE Signal Processing Letters*, 29:707–711, 2021.

[7] Dongyun Lin, Yiqun Li, Shitala Prasad, Tin Lay Nwe, Sheng Dong, and Zaw Min Oo. CAM-guided multi-path decoding u-net with triplet feature regularization for defect detection and segmentation. *Knowledge-Based Systems*, 228:107272, 2021.

[8] Dongyun Lin, Yiqun Li, Shudong Xie, Tin Lay Nwe, and Sheng Dong. DDR-ID: Dual deep reconstruction networks based image decomposition for anomaly detection. *Journal of Ambient Intelligence and Humanized Computing*, pages 1–15, 2021.

[9] Dongyun Lin, Yiqun Li, Tin Lay Nwe, Sheng Dong, and Zaw Min Oo. RefineU-Net: Improved U-Net with progressive global feedbacks and residual attention guided local refinement for medical image segmentation. *Pattern Recognition Letters*, 2020.

[10] Dongyun Lin, Lei Sun, Kar-Ann Toh, Jing Bo Zhang, and Zhiping Lin. Twin SVM with a reject option through ROC curve. *Journal of the Franklin Institute*, 355(4):1710 – 1732, 2018.

[11] Dongyun Lin, Lei Sun, Kar-Ann Toh, Jing Bo Zhang, and Zhiping Lin. Biomedical image classification based on a cascade of an SVM with a reject option and subspace analysis. *Computers in Biology and Medicine*, 96:128 – 140, 2018.

[12] Dongyun Lin, Zhiping Lin, Jiuwen Cao, Ramraj Velmurugan, E Sally Ward, and Raimund J Ober. A two-stage method for automated detection of ring-like endosomes in fluorescent microscopy images. *PloS one*, 14(6):e0218931, 2019.

[13] Dongyun Lin, Yi Cheng, Yiqun Li, Shitala Prasad, and Aiyuan Guo. Mlsa-unet: End-to-end multi-level spatial attention guided unet for industrial defect segmentation. In *2022 IEEE International Conference on Image Processing (ICIP)*, pages 441–445. IEEE, 2022.

[14] Dongyun Lin, Yiqun Li, Yi Cheng, Shitala Prasad, and Aiyuan Guo. Masked face recognition via self-attention based local consistency regularization. In *2022 IEEE International Conference on Image Processing (ICIP)*, pages 436–440. IEEE, 2022.

[15] Shitala Prasad, Yiqun Li, Dongyun Lin, and Aiyuan Guo. Implicit shape biased few-shot learning for 3d object generalization. In *2022 IEEE International Conference on Image Processing (ICIP)*, pages 3436–3440. IEEE, 2022.

[16] Tin Lay Nwe, Ramanpreet Singh Pahwa, Richard Chang, Oo Zaw Min, Wang Jie, Yiqun Li, Dongyun Lin, Shitala Prasad, and Sheng Dong. On the use of component structural characteristics for voxel segmentation in semicon 3d images. In *ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 2694–2698. IEEE, 2022.

[17] Dongyun Lin, Yanpeng Cao, Wenbin Zhu, and Yiqun Li. Few-shot defect segmentation leveraging abundant defect-free training samples through normal background regularization and crop-and-paste operation. In *2021 IEEE International Conference on Multimedia and Expo (ICME) (Oral Presentation)*.

[18] Dongyun Lin, Yiqun Li, Shitala Prasad, Tin Lay Nwe, Sheng Dong, and Zaw Min Oo. Cam-guided U-Net with adversarial regularization for defect segmentation. In *2021 IEEE International Conference on Image Processing (ICIP)*. IEEE.

[19] Yi Cheng, Ying Sun, Dongyun Lin, and Joo-Hwee Lim. Action relational graph for weakly-supervised temporal action localization. In *2021 IEEE International Conference on Image Processing (ICIP)*. IEEE.

[20] Dongyun Lin, Zhiping Lin, Ramraj Velmurugan, and Raimund J Ober. Automatic endosomal structure detection and localization in fluorescence microscopic images. In *Circuits and Systems (ISCAS), 2017 IEEE International Symposium on*, pages 1–4. IEEE, 2017.

[21] Dongyun Lin, Zhiping Lin, Lei Sun, Kar-Ann Toh, and Jiuwen Cao. LLC encoded BoW features and softmax regression for microscopic image classification. In *Circuits and Systems (ISCAS), 2017 IEEE International Symposium on*, pages 1–4. IEEE, 2017.

[22] Dongyun Lin, Zhiping Lin, Shakeela Sothiharan, Lei Lei, and Jingbo Zhang. An SVM based scoring evaluation system for fluorescence microscopic image classification. In *Digital Signal Processing (DSP), 2015 IEEE International Conference on*, pages 543–547. IEEE, 2015.

[23] Dongyun Lin, Yiqun Li, Shitala Prasad, Tin Lay Nwe, Sheng Dong, and Zaw Min Oo. CAM-UNET: Class activation map guided UNET with feedback refinement for defect segmentation. In *2020 IEEE International Conference on Image Processing (ICIP)*. IEEE.

[24] Shitala Prasad, Yiqun Li, Dongyun Lin, and Dong Sheng. maskedfacenet: A progressive semi-supervised masked face detector. In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision*, pages 3389–3398, 2021.

[25] Shitala Prasad, Dongyun Lin, Yiqun Li, Dong Sheng, and Oo Zaw Min. Rethinking of deep models parameters with respect to data distribution. In *2020 25th International Conference on Pattern Recognition (ICPR)*, pages 8562–8569. IEEE, 2021.

[26] Zhiyong Chen, Jiuwen Cao, Dongyun Lin, Jianzhong Wang, and Xuegang Huang. Vibration source classification and propagation distance estimation system based on spectrogram and kelm. *Cognitive Computation and Systems*, 1(1):26–33, 2019.

[27] Long D Nguyen, Ruihan Gao, Dongyun Lin, and Zhiping Lin. Biomedical image classification based on a feature concatenation and ensemble of deep cnns. *Journal of Ambient Intelligence and Humanized Computing*, pages 1–13, 2019.

[28] Tin Lay Nwe, Zaw Min Oo, Saisubramaniam Gopalakrishnan, Dongyun Lin, Shitala Prasad, Sheng Dong, Yiqun Li, and Ramanpreet Singh Pahwa. Improving 3d brain tumor segmentation with predict-refine mechanism using saliency and feature maps. In *2020 IEEE International Conference on Image Processing (ICIP)*. IEEE.

[29] Xu Zhang, Yunfeng Liang, Dongyun Lin, Zhiping Lin, Steven Tien Guan Thng, Emily Yiping Gan, and Evelyn Yuxin Tay. Reaction-diffusion based level set method with local entropy thresholding for melasma image segmentation. In *Control, Automation, Robotics and Vision (ICARCV), 2016 14th International Conference on*, pages 1–5. IEEE, 2016.

[30] Long D Nguyen, Dongyun Lin, Zhiping Lin, and Jiuwen Cao. Deep CNNs for microscopic image classification by exploiting transfer learning and feature concatenation. In *Circuits and Systems (ISCAS), 2018 IEEE International Symposium on*, pages 1–5. IEEE, 2018.

[31] Huiping Zhuang, Beom-Seok Oh, Dongyun Lin, Kar-Ann Toh, and Zhiping Lin. Multicomponent signal decomposition using morphological operations. In *2018 IEEE 23rd International Conference on Digital Signal Processing (DSP)*, pages 1–5. IEEE, 2018.

[32] Tin Lay Nwe, Balaji Nataraj, Xie Shudong, Li Yiqun, Lin Dongyun, and Dong Sheng. Discriminative features for incremental learning classifier. In *2019 IEEE International Conference on Image Processing (ICIP)*, pages 1990–1994. IEEE, 2019.

[33] Shudong Xie, Yiqun Li, Dongyun Lin, Tin Lay Nwe, and Sheng Dong. Meta module generation for fast few-shot incremental learning. In *The IEEE International Conference on Computer Vision (ICCV) Workshops*, Oct 2019.

[34] Tin Lay Nwe, Ramanpreet Singh Pahwa, Richard Chang, Zaw Min Oo, Wang Jie, Yiqun Li, Dongyun Lin, Shitala Prasad, and Dong Sheng. On the use of component structural characteristics for voxel segmentation in semicon 3D images. In *2022 IEEE International Conference on Acoustics, Speech and Signal Processing*. IEEE.