

Hui Lin

Machine Learning · Computer Vision · Signal Processing · Image Generation · Medical Application

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Education

Ph.D. student in Electrical Engineering	3.9/4.0		09.2019 - current
<i>Northwestern University, advised by Aggelos Katsaggelos and Daniel Kim</i>			<i>Evanston, Illinois, USA</i>
M.S. in Mechanical Engineering	92.7/100.0	rank 1	09.2016 – 06.2019
<i>Huazhong University of Science and Technology, advised by Bin Li and Xinggang Wang</i>			<i>Wuhan, Hubei, China</i>
B.S. in Materials Processing and Control Engineering	90.1/100.0	rank 3	09.2012 – 06.2016
<i>Huazhong University of Science and Technology (Qiming College)</i>			<i>Wuhan, Hubei, China</i>

Skills

Machine Learning:	ResNet, RNN, GAN, UNet, Transformer, YOLO, SSD, GNN, Diffusion
Tools:	PyTorch, Docker, Git, CUDA, Numpy, Opencv, Scikit-learn, Caffe, AWS
Programming:	Python, Matlab, SQL, C++, R, JavaScript

Algorithm Competitions

MICCAI 2024	FLARE, MyoPS++, MBAS, DIAMOND	ongoing
ISBI 2024	JustRAIGS	5th Place (5%)
MICCAI 2023	ARCADE (Task 1 and 2)	3rd Place (1%)

Selected Working and Research Experience (13 projects)

Hypertension Classification via Wrist-collected PPG	OPPO US Research Center	06.2024-08.2024
<ul style="list-style-type: none">Developed ResNet, Transformer, and LSTM models with over 68k spot-check instances from 358 subjects.Our compact model, with just 0.124M parameters, outperformed others in dynamic, noisy, real-world scenarios across data from 448 diverse subjects.		
Unsupervised Domain Adaptation for Medical Image Segmentation		06.2023 – Present
<ul style="list-style-type: none">Applied GAN to translate images between modalities (CT, MRI) without needing paired data.Validated on a large-scale dataset achieving a notable 11.4% increase in DSC and a 13.1% improvement in NSD.		
Coronary Artery Segmentation and Stenosis Detection		05.2023 – 02.2024
<ul style="list-style-type: none">Proposed ensemble models based on YOLO and UNet, trained on preprocessed data to address challenges of low contrast and non-uniform illuminationOur method achieved an impressive 3rd place ranking out of over 200 entries, with an F1 score of 0.5348.		
Segmentation of Large MRI Volumes		09.2021 – 09.2023
<ul style="list-style-type: none">Proposed transposed transformer blocks that reduce the size and computational complexity by 2.8x and 3.8x.		
Temperature Trending in Additive Manufacturing Processes		03.2020 – 12.2021
<ul style="list-style-type: none">Meshed parts with diverse and complex geometries, and simulated temperature history using FEA.Combined a GNN with a GRU to forecast long-term thermal histories for unseen geometries.		
Defect Image Sample Generation		10.2017 – 06.2019
<ul style="list-style-type: none">Combining CycleGAN and D2GAN for generating industrial defect images.Enhanced the accuracy of anomaly detection by 0.80% and defect classification by 2.95%.		
LED Chip Defect Detection		11.2015 – 06.2019
<ul style="list-style-type: none">Pioneered the simultaneous classification and localization of chip defects within a single CNN.Utilized CAM to localize defect regions without needing region-level human annotations.Outperformed others with an impressive accuracy with only 5.04% inaccuracy.		

Selected Publications (12 First-Author Papers, 759 citations)

Longitudinal Wrist PPG Analysis for Reliable Hypertension Risk Screening	ICASSP 2025
<i>Lin, H., Li, J., et al.</i>	
DRL-STNet: UDA for Cross-modality Medical Image Segmentation	MICCAI 2024 workshop
<i>Lin, H., Schiffers, F., et al.</i>	
Brighteye: Glaucoma Screening with Color Fundus Photographs based on Vision Transformer	ISBI 2024
<i>Lin, H., Apostolidis, C., Katsaggelos, A.</i>	
Usformer: A small network for left atrium segmentation of 3D LGE MRI	Heliyon
<i>Lin, H., López-Tapia, S., Katsaggelos, A., et al.</i>	
Defect Image Sample Generation with GAN for Improving Defect Recognition	IEEE TASE
<i>Niu, S., Li, B., Wang, X. and Lin, H.</i>	
Automated Defect Inspection of LED Chip using Deep Convolutional Neural Network	JIM
<i>Lin, H., Li, B., Wang, X. et al.</i>	
Geometry-agnostic Data-driven Thermal Modeling using GNNs	Additive Manufacturing
<i>Mozaffar, M., Liao, S., Lin, H., Ehmann, K. and Cao, J.</i>	