

Hui Lin

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Education

Ph.D. student in Electrical Engineering	3.9/4.0	09.2021 – Present
<i>Northwestern University, advised by Aggelos Katsaggelos</i>		<i>Evanston, Illinois, USA</i>
Ph.D. student in Mechanical Engineering		09.2019 – 09.2021
<i>Northwestern University (Transferred to Electrical Engineering)</i>		<i>Evanston, Illinois, USA</i>
M.S. in Mechanical Engineering	92.7/100.0	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	09.2012 – 06.2016
<i>Huazhong University of Science and Technology (Qiming College)</i>		<i>Wuhan, Hubei, China</i>

Selected Research Experience

Unsupervised Domain Adaptation for Medical Image Segmentation	12.2023 – Present
<ul style="list-style-type: none">• Developed DRL-STNet, an unsupervised domain adaptation framework for cross-modality medical image segmentation.• Applied disentangled representation learning to translate images between modalities while preserving anatomical integrity without needing paired data.• Implemented iterative self-training with pseudo-labeling to enhance segmentation performance using unlabeled data.• Validated the framework on the FLARE challenge dataset, which includes various abdominal organs, imaging sequences, and institutions, achieving a notable 11.4% increase in Dice similarity coefficient and a 13.1% improvement in Normalized Surface Dice.	
Thermal History Prediction for Directed Energy Deposition	03.2020 – 12.2021
<ul style="list-style-type: none">• Proposed a novel approach combining a Graph Neural Network (GNN) with a Recurrent Neural Network (RNN) to model spatiotemporal dependencies in additive manufacturing processes.• Developed a predictive model capable of forecasting long-term thermal histories for unseen geometries in the Directed Energy Deposition process.	
Defect Image Sample Generation	10.2017 – 06.2019
<ul style="list-style-type: none">• Pioneered using a Generative Adversarial Network (GAN) for generating industrial defect images, addressing the shortage of defect samples in the manufacturing domain.• 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 Convolutional Neural Network (CNN).• Utilized Class Activation Mapping (CAM) to localize defect regions without needing region-level human annotations.• Outperformed competing methods in detecting line blemishes and scratch marks, achieving an impressive accuracy with only 5.04% inaccuracy.	

Selected Publications

- [1] **Lin, H.**, Tavakoli, N., et al.: GenSegNet: Leveraging Synthetic Sequences and Pseudo Labels for Multi-Sequence Myocardial Pathology Segmentation. Submitted to MICCAI 2024 Challenge.
- [2] **Lin, H.**, Schiffrers, F., et al.: DRL-STNet: Unsupervised Domain Adaptation for Cross-modality Medical Image Segmentation via Disentangled Representation Learning. Submitted to MICCAI 2024 Challenge.
- [3] **Lin, H.**, Li, J., et al.: Longitudinal Wrist PPG Analysis for Reliable Hypertension Risk Screening Using Deep Learning. Submitted to ICASSP 2025.
- [4] **Lin, H.**, Apostolidis, C., Katsaggelos, A.K.: Brighteye: Glaucoma screening with color fundus photographs based on vision transformer. In: 2024 ISBI.
- [5] **Lin, H.**, Lopez Tapia, S., Schiffrers, F., et al. Usformer: A Small Network for Left Atrium Segmentation of 3D LGE MRI. Heliyon (2024). ([Talk](#), [Slides](#))
- [6] **Lin, H.**, Liu, T., Katsaggelos, A., Kline, A. StenUNet: Automatic Stenosis Detection from X-ray Coronary Angiography. Submitted to MICCAI 2023 Challenge.
- [7] **Lin, H.**, Liu, T., Katsaggelos, A., Kline, A. YOLO-Angio: An Algorithm for Coronary Anatomy Segmentation. Submitted to MICCAI 2023 Challenge.
- [8] Mozaffar, M., Liao, S., **Lin, H.**, Ehmann, K. and Cao, J. Geometry-agnostic data-driven thermal modeling of additive manufacturing processes using graph neural networks. Additive Manufacturing (2021).
- [9] Niu, S., Li, B., Wang, X. and **Lin, H.** Defect Image Sample Generation With GAN for Improving Defect Recognition. IEEE Transactions on Automation Science and Engineering (2020).
- [10] **Lin, H.**, Li, B., Wang, X. et al. Automated defect inspection of LED chip using deep convolutional neural network. Journal of Intelligent Manufacturing (2019). (**highly cited paper**)

Working Experience

Deep Learning Research Internship	OPPO US Research Center	06.2024-08.2024
<ul style="list-style-type: none">Utilized ResNet and Transformer models to analyze wrist-collected PPG data for hypertension risk screening, focusing on long-term trends across multiple days.Developed a compact 0.124M parameter model that outperformed traditional methods in real-world evaluations, including data from 448 diverse subjects.Validated the model on PPG data collected during daily activities, proving its robustness in dynamic, noisy environments.		
Minister of Health	Graduate Student Union of Mechanical Department	09.2016-09.2017
<ul style="list-style-type: none">Awarded 2nd prize in the 'Top Ten Characteristic Health Brand Events'.		

Reviewer Service

- [1] IEEE Transactions on Automation Science and Engineering (T-ASE)
- [2] Journal of Intelligent Manufacturing (JIM)
- [3] IEEE Journal of Biomedical and Health Informatics (JBHI)
- [4] IEEE Transactions on Medical Imaging (IEEE TMI)
- [5] IEEE International Symposium on Biomedical Imaging (ISBI)
- [6] Medical Image Computing and Computer Assisted Intervention (MICCAI)
- [7] IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
- [8] Medical Imaging with Deep Learning (MIDL)

Awards & Honors

Justified Referral in AI Glaucoma Screening Challenge - 5th Place <i>ISBI 2024</i>	2024
Automatic Region-based Coronary Artery Disease Challenge - 3rd Place <i>MICCAI 2023</i>	2023
Predictive Science and Engineering Design (PSED) Fellowship <i>Northwestern University</i>	2020
Outstanding Graduate Student <i>Huazhong University of Science and Technology</i>	2016&2019
National Scholarship of Master <i>The People's Republic of China</i>	2017
National Encouragement Scholarship <i>The People's Republic of China</i>	2015
Third Prize in the 6th YGB National College Students Casting Process Design Competition <i>Foundry Institution of Chinese Mechanical Engineering Society</i>	2015
Outstanding Individual in HUST College Students Technical Innovation <i>Huazhong University of Science and Technology</i>	2015

Specialized Skills

Machine Learning Models: ResNet, RNN, GNN, GAN, Transformer, Diffusion Models
Frameworks: PyTorch, Docker, Git, PyTorch Lightning
Programming Languages: Python, Matlab, C++, JavaScript, Assembly Language

Other Interests

Jogging (half marathon), Badminton, Fitness, Piano, Knitting, Chinese Calligraphy