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
Northwestern University, advised by Aggelos Katsaggelos and Daniel Kim *Evanston, Illinois, USA*

M.S. in Mechanical Engineering **92.7/100.0** **rank 1** 09.2016 – 06.2019
Huazhong University of Science and Technology, advised by Bin Li and Xinggang Wang *Wuhan, Hubei, China*

B.S. in Materials Processing and Control Engineering **90.1/100.0** **rank 3** 09.2012 – 06.2016
Huazhong University of Science and Technology (Qiming College) *Wuhan, Hubei, China*

Skills

Machine Learning:	ResNet, RNN, GAN, UNet, Transformer, YOLO, SSD, GNN, Diffusion
Tools:	PyTorch, Docker, Git, CUDA, Numpy, pandas, Opencv, Scikt-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

- 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

- 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

- Proposed ensemble models based on **YOLO** and **UNet**, trained on preprocessed data to address challenges of low contrast and non-uniform illumination
- Our 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

- 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

- **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

- 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

- 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, 762 citations)

Longitudinal Wrist PPG Analysis for Reliable Hypertension Risk Screening ICASSP 2025
***Lin, H.**, Li, J., et al.*

DRL-STNet: UDA for Cross-modality Medical Image Segmentation MICCAI 2024 workshop
***Lin, H.**, Schiffers, F., et al.*

Brighteye: Glaucoma Screening with Color Fundus Photographs based on Vision Transformer ISBI 2024
***Lin, H.**, Apostolidis, C., Katsaggelos, A.*

Usformer: A small network for left atrium segmentation of 3D LGE MRI Heliyon
***Lin, H.**, López-Tapia, S., Katsaggelos, A., et al.*

Defect Image Sample Generation with GAN for Improving Defect Recognition IEEE TASE
*Niu, S., Li, B., Wang, X. and **Lin, H.*** *236 citations*

Automated Defect Inspection of LED Chip using Deep Convolutional Neural Network JIM
***Lin, H.**, Li, B., Wang, X. et al.* *258 citations*

Geometry-agnostic Data-driven Thermal Modeling using GNNs Additive Manufacturing
*Mozaffar, M., Liao, S., **Lin, H.**, Ehmann, K. and Cao, J.* *58 citations*