Chenxin Li

⊙ **Website** ꙮ **Scholar** ⌂ **GitHub** ⊙ **WeChat**
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RESEARCH INTERESTS

Algorithm: Generative Model, Foundation Model, Neural Rendering, Efficient Learning
Interdisciplinary Application: Biomedical Imaging, Surgical VR/AR/Robotics, Social Network

EDUCATION

The Chinese University of Hong Kong (CUHK)   Aug. 2023 - Now
Ph.D., Electronic Engineering   Advisor: Prof. Yixuan Yuan

Xiamen University (XMU)   Sep. 2019 - Jun. 2022
M.S., Information & Communication Engineering   Advisor: Prof. Xinghao Ding&Prof. Yue Huang

Xiamen University (XMU)   Sep. 2015 - Jun. 2019
B.S., Information & Communication Engineering   GPA: 3.72/4.0

SELECTED PUBLICATIONS&MANUSCRIPTS

Preprint 2024 [page]: <u>C. Li</u>*[1], H. Liu*, Y. Liu*, B. Feng, W. Li, X. Li, Z. Chen, J. Shao, Y. Yuan, "`Endora: Video Generation Models as Endoscopy Simulators`".

Preprint 2024 [page]: Y. Liu*, <u>C. Li</u>*, C. Yang, Y. Yuan, "`EndoGaussian: Real-time Gaussian Splatting for Dynamic Endoscopic Scene Reconstruction`".

3DV 2024 (Accepted) [page]: P. Pan*, Z. Fan*. B. Feng, P. Wang, <u>C. Li</u>, Z. Wang, " `Cas6D: Learning to Estimate 6DoF Pose from Limited Data: A Few-Shot, Generalizable Approach using RGB Images` ", International Conference on 3D Vision.

ICCV 2023 [link]: <u>C. Li</u>, B. Feng*, Z. Fan*, P. Wang, Z. Wang, "`StegaNeRF: Embedding Invisible Information within Neural Radiance Fields`", IEEE International Conference on Computer Vision.

ICASSP 2023 [link]: Y. Liu, <u>C. Li</u>, X. Tu, Y. Huang, X. Ding "`Hint-Dynamic Knowledge Distillation`", IEEE International Conference on Acoustics, Speech, and Signal Processing.

ECCV 2022 [link]: <u>C. Li</u>, M. Lin, Z. Ding, N. Lin, Y. Zhuang, X. Ding, Y. Huang, L. Cao, "`Knowledge Condensation Distillation`", European Conference on Computer Vision.

ICONIP 2022 [link]: Z. Ding, Q. Dong, H. Xu, <u>C. Li</u>, X. Ding, Y. Huang, "`Unsupervised Anomaly Segmentation for Brain Lesions Using Dual Semantic-Manifold Reconstruction`", International Conference on Neural Information Processing.

MICCAI 2021 [link]: <u>C. Li</u>, Y. Zhang*, X. Lin, L. Sun, Y. Zhuang, Y. Huang, X. Ding, Y. Yu, "`Generator Versus Segmentor: Pseudo-healthy Synthesis`", International Conference on Medical Image Computing and Computer Assisted Intervention.

ICIP 2021 [link]: <u>C. Li</u>, Y. Zhang, Z. Liang, X. Ding, Y. Huang, "`Consistent Posterior Distributions under Vessel-Mixing: A Regularization for Cross-Domain Retinal Artery/Vein Classification`", IEEE International Conference on Image Processing.

CIKM 2021 [link]: Z. Liang, Y. Rong, <u>C. Li</u>, Y. Zhang, Y. Huang, T. Xu, X. Ding, J. Huang, "`Unsupervised Large-Scale Social Network Alignment via Cross Network Embedding`", Conference on Information and Knowledge Management.

NCA 2021 [link]: <u>C. Li</u>, W. Ma, L. Sun, Y. Huang, X. Ding, Y. Huang, G. Wang, Y. Yu, "`Hierarchical Deep Network with Uncertainty-aware Semi-supervised Learning for Vessel Segmentation`", Neural Computing and Applications.

CBM 2021 [link]: <u>C. Li</u>, Q. Qi, X. Ding, Y. Huang, D. Liang, Y. Yu, "`Domain Generalization on Medical Imaging Classification using Episodic Training with Task Augmentation`", Computers in Biology and Medicine.

CBM 2021 [link]: L. Sun, <u>C. Li</u>, X. Ding, Y. Huang, G. Wang, Y. Yu, "`Few-shot Medical Image Segmentation using a Global Correlation Network with Discriminative Embedding`", Computers in Biology and Medicine.

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[1]* denotes equal-contribution first authorship.

SELECTED PROJECTS

Efficient, Fidelity and Responsible 2D/3D Visual Content (Re-)Creation

(**A**) **Dynamic/3D surgical scene simulation**: In *Endora*, we present the first exploration into high-fidelity medical video generation on endoscopy scenes and demonstrates the versatile ability through successful applications in video-based disease diagnosis and 3D surgical scene reconstruction. In *Endo-Gaussian*, we present a framework that can reconstruct surgical scene under real-time rendering efficacy (195 FPS real-time, 100x gain), better rendering quality (35+ PSNR), and less training overhead (within 2 min/scene). (**B**) **Invisible watermarking for 3D creation**: In *StegaNeRF* (ICCV'23), we present the first exploration into instilling customizable, imperceptible, and recoverable information to Neural Radiance Field (a.k.a. NeRF) renderings and reveal the ability of NeRF in embedding secrete information (*e.g.*, digital signature, multi-modal information) without sacrificing the rendering quality. (**C**) **Biological visual recreation**: Translate the biological visual materials (e.g., MRI) across diverse conditions (e.g., disease degree). In *GVS* (MICCAI'21), we present a novel adversarial training regime, Generator versus Segmentor. In another work *ICST* (ICONIP'22), we propose a autoencoder based on a novel semantic-based manifold , facilitating accurate location and editing for lesions in brain MRI.

Efficient Knowledge Transfer from Large/Foundation Models

Knowledge distillation (KD) transfers the knowledge from a high-capacity teacher network to strengthen a smaller student model. In *Knowledge Condensation Distillation* (ECCV'22) we explore an data-efficient distillation framework with a knowledge condensation strategy, which dynamically identifies and summarizes the informative knowledge points as a compact knowledge set alongside the knowledge transfer. In our another work *Hint-dynamic Distillation* (ICASSP'23), we reveal the diverse effect of different knowledge hints across the distillation procedure, and design a dynamic learning scheme to efficiently utilize the various knowledge hints from the teacher.

Scaling Up Model Training from Imperfect Data

To scale up the deep model training beyond the limitation of requiring massive well-labeled *i.i.d* training data, we study generalization (unsupervised domain adaptation/domain generalization), semi-supervised learning, few-shot learning, *etc.*, tested on the interdisciplinary application of biomedical visual materials, including retinal fund images, abdominal organ CT, etc. Please see *Vessel-Mixing* (ICIP'21) for unsupervised domain adaptation, *UASS* (NCA'21) for semi-supervised learning, *Task-Aug* (CBM'21) for domain generailzaition, *GCN-DE* (CBM'21) for few-shot learning.

SELECTED EXPERIENCE

AIM Group, The Chinese Univerity of Hong Kong (CUHK)　　Apr. 2023 - July. 2023
Research Assistant at *Creative 2D/3D Vision*, Advisor: Prof. Yixuan Yuan

Deepwise　　Jan. 2021 - Oct. 2021
Research Intern at *Image segmentation*, Advisor: Prof. Yizhou Yu

SmartDSP Lab, Xiamen University (XMU)　　Sep. 2018 - Aug. 2019
Research Assistant at *Image segmentation*, Advisor: Prof. Xinghao Ding

SELECTED HONORS & AWARDS

- Outstanding Master's Thesis of Fujian Province [URL]　　Jun. 2022
- Outstanding Graduates of Xiamen University　　Jun. 2022
- Dean's Honor List, Xiamen University　　May. 2017
- Panasonic Scholarship　　Oct. 2018
- Clarion Scholarship　　Oct. 2017

SELECTED SERVICES

Conference Reviewer: ICML'24, ICLR'24, NeurIPS'23, CVPR'24/23, ICCV'23, ACM MM'23, MICCAI'24/23
Journal Reviewer: DMLR, PR, TNNLS, NCA