Hongwei Bran Li Ph.D.

Address: 13a Ware St., Cambridge, MA, USA
Email: holi2@mgh.harvard.edu Website: https://hongweilibran.github.io/

RESEARCH INTERESTS

My research focuses on developing AI-driven methods to analyze medical images. I build models that can improve the accuracy and trustworthiness of diagnostic tools and assess their uncertainties for radiology and oncology. My goal is to bridge advanced computational techniques with practical clinical applications, ensuring that the benefits of AI reach real-world healthcare settings effectively.

EDUCATION

Ph.D. in Computer Science from Technical University of Munich, Germany 12.2017-09.2023

Grade: Summa cum Laude

- **Thesis**: "*Efficient and cross-domain deep learning for advanced neuroimage analysis*"
- **Research** on developing deep learning methods for computational neuroimaging
- **Advisor**: Bjoern Menze. **Committee**: Daniel Rueckert, Tammy Riklin Raviv, and Koen Van Leemput

Visiting Ph.D. student at University of Zurich and ETH AI Center, Switzerland 11.2020-08.2023

- **Research** on establishing segmentation methods for microscopy images of zebrafish and developing self-supervised deep learning for large-scale medical datasets.

M.Sc. in Informatics, Sun Yat-sen University, China 09.2014-07.2017

Thesis: *"Machine learning for HEP-2 cell classification in microscopy images"*

Visiting M.Sc. student at School of Computing, University of Dundee, UK 12.2016-07.2017

- **Research** on developing automated brain white matter hyperintensities segmentation algorithm

B.Sc. in Electrical Engineering, Guangdong University of Technology, China. 09.2009-07.2013

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher at Harvard Medical School, USA 08.2023-Present

Advisors: Juan Eugenio Iglesias, Matthew Rosen

- **Research** on developing novel deep learning methods for image analysis of ultra-low-field (0.064T) and ultra-high-field (7T, and 14T) MR images. Ongoing projects are:

  (1) Image super-resolution of ultra-low-field, 7T, and14T MR images with 3D diffusion models.

  (2) Automated segmentation of brain disorders in 3D heterogeneous multi-contrast MRI.

  (3) Uncertainty estimation for deep learning methods.

Research Assistant at University of Zurich and University Hospital 11.2020-07.2023

- Project: Self-supervised deep learning techniques for large-scale medical datasets.

Data Scientist in AI Startup Orbem (part-time, 10h/week) 12.2019-12.2020

- Project: Deep-learning-based classification methods for 3D MR imaging of the chicken eggs.
- We were among the top-10 AI startups worldwide for IBM AI XPRIZE in 2020.

GRANTS AND FELLOWSHIPS

Postdoctoral Mobility Grant from Swiss National Foundation (top 10%, **PI**, ~140k Euros) 2023

Grant: *Deep learning methods for portable low-field MR imaging in neurocritical care of stroke*

Individual Postdoctoral Grant (top 30%, University of Zurich, **PI**, ~45k Euros) 2021

Grant: *Robust self-supervised deep learning in quantitative medical imaging*

Nvidia GPU Research Grant (top 10%, **PI**, ~ 6k Euros) 2021

Grant: *Interpretable self-supervised deep learning for 3D medical imaging*

AWARDS AND HONORS

Outstanding Reviewer for Conf. on Computer Vision and Pattern Recognition (CVPR) 2024

- *Recognized among top 2% of reviewers for exceptional contribution*

Outstanding Reviewer for Conf. on Medical Imaging with Deep Learning (MIDL) 2024

- *Recognized among top 2% of reviewers for exceptional contribution*

Best Paper Runner-Up at MIDL (top 2%, co-authored) 2022

Winner of MICCAI White Matter Hyperintensities Segmentation Challenge (1/20, Team Lead) 2017

Outstanding Bachelor Thesis on Retinal Image Classification Using Machine Learning 2013

ACADEMIC ACTIVITIES

Area Chair: Medical Image Computing and Computer Assisted Interventions (MICCAI) 2024&2025

Senior PC: European Conference on Artificial Intelligence (ECAI) 2025

Founding Committee and Lead Organizer of MICCAI Challenges (benchmark)

- Fetal Brain Tissue Annotation and Segmentation Challenge (FeTA) 2021,2022,2024
- Brain MR Image Synthesis Challenge (as a part of BraTS) 2023,2024
- Uncertainty Quantification in Medical Image Segmentation (QUBIQ) 2020,2021

Co-organizer of MICCAI Challenges (benchmark)

- Topology-Aware Anatomical Segmentation of the Circle of Willis for CTA and MRA. 2023, 2024
- Dental Enumeration and Diagnosis on Panoramic X-rays 2023
- Enlarged Perivascular Spaces (EPVS) Segmentation Challenge 2024

Co-organizer of Conference Track: Special Track on AI in Medical Imaging in CBMS 2023&2024.

Guest Editor for:

- Frontiers in Human Neuroscience**,** "*Advances in Computational Neuroimaging for Neurological Diseases*" (IF: 4.7)
- Journal of Bioengineering, "*Advances in Medical 3D Vision: Voxels and Beyond*" (IF: 3.8)

Reviewer for Journals, Conferences and Workshops

- MICCAI (2019-2023), MIDL (2019-2025), CVPR (2021-2025), ECCV (2022, 2024), NeurIPS 2024, AAAI (2023, 2025), AISTATS (2025), ICLR (2025)
- IEEE Transactions on Medical Imaging, Medical Image Analysis (14 times), IEEE-JBHI (12 times)
- Nature Communications, NeuroImage, MICCAI UNSURE/PIPPI/BrainLes workshops, etc

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TEACHING EXPERIENCE AND LECTURES

- **Linear Algebra Practice** at Sun Yat-sen University (audience: undergraduates, 2015)
  Presentation, discussion of solutions and advanced topics in linear algebra course. 80 hrs in total.
- **Deep Learning Practice** at Technical University of Munich (audience: postgraduates, 2018, 2019)
  Teaching Python and Tensorflow, simple machine learning methods (SVM and random forests), and deep learning for image classification. 24 hrs in total.
- **Deep Learning Course** at AI4Health Summer School in Paris (audience: Ph.D., AI researchers, 2023)
  Teaching Python, PyTorch, and deep learning for 3D medical image segmentation and shape modeling. 12 hrs in total.

MENTORSHIP AS PRIMARY ADVISOR

1. Kilian Schimitt, TUM master student 11.2023-05.2024
   Thesis on machine unlearning for medical image classification (One co-authored paper is under review)
2. Qingqiao Hu, UCLA master student, now a PhD candidate at Stony Brook University 11.2022-07.2024
   Research projects on uncertainty estimation and probabilistic modeling
   (published one paper at MICCAI' 2022. Two papers are under review)
3. Agata Łabiak, TUM bachelor student 11.2021-05.2022
   Bachelor project on the interpretability of contrastive learning
4. Yujun Liu, TUM master student 04.2022-10.2022
   Thesis on latent diffusion model for pathology image generation
5. Maximilian Berger, TUM master student 11.2020-05.2021
   Thesis on federated learning for medical imaging
6. Sunita Gopal, TUM master student 03.2020-09.2020
   Thesis on disentangled learning for medical image synthesis
7. Yuqian Zhang, LMU master student 11.2019-06.2020
   Research project on fMRI feature extraction and brain activity classification.

HOBBY

- Reading novels.
- Team sports: Indoor/beach volleyball at competitive amateur level.
  Awarded national silver medal (China, 2017), conference cup champion (Scotland, 2017).
  Competed in the Bavarian league in Germany (2017–2018).