

# Mingxuan Liu

Center of Biomedical Imaging Research (CBIR), Tsinghua University, Beijing, P.R. China  
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## EDUCATION

<b>PhD Student, School of Biomedical Engineering, Tsinghua University, China</b>	2024.09 - Now
Advisor: Prof. Qiyuan Tian	
<b>BEng Student, School of Biomedical Engineering, Tsinghua University, China</b>	2021.09 - 2024.08
<b>BEng Student, Department of Chemical Engineering, Tsinghua University, China</b>	2019.09 - 2021.08

## AWARDS AND HONORS

- BEIHAI Summit Second Prize of Oral Presentation 2025
- National Scholarship, Ministry of Education, P.R. China 2025
- MICCAI autoPET IV Challenge 1st Place Winner 2025
- MICCAI VLM3D Challenge 2nd Place Winner 2025
- OHBM Merit Award (Awarded: \$850, Top 1.6%) 2025
- ISMRM Educational Stipend Award 2025
- National Scholarship, Ministry of Education, P.R. China 2024
- First Prize at National Biomedical Engineering Innovation Design Competition for College Students 2024
- Outstanding Graduates of Beijing, Beijing Municipal Administration Committee 2024
- Outstanding Graduates of Tsinghua University 2024
- ISMRM Magna Cum Laude Merit Award (Top 15%) 2024
- ISMRM Educational Stipend Award 2024
- IEEE ICCBD+AI Best Paper Award 2024
- Second Prize at the 42nd “Challenge Cup” of Tsinghua University 2024
- Third Prize at the 42nd “Challenge Cup” of Tsinghua University 2024
- Singapore AI Health Summit Poster Competition 3rd Place Winner (Awarded: \$3000) 2023
- National Scholarship, Ministry of Education, P.R. China 2023
- Scholarship for Academic Excellence, Tsinghua University 2022
- Scholarship for Science and Technology Innovation Excellence, Tsinghua University 2022
- Second Prize for Outstanding Projects of the Students Research Training Program, Tsinghua University 2022
- Scholarship for Academic Excellence, Tsinghua University 2020

## SELECTED PUBLICATION

# co-first author | \* corresponding author

## JOURNAL PAPERS

- [1] Liu M#, Tang J#, Li H, Yong C, Qi J, Li S, Wang K, Gan J, Wang Y\*, Chen H\*. *Spiking-PhysFormer: Camera-Based Remote Photoplethysmography with Parallel Spike-driven Transformer*. Neural Networks, 2025. DOI: <https://doi.org/10.1016/j.neunet.2025.107128>

- [2] **Liu M**, Jiao Y, Lu J, Chen H\*. *Anomaly Detection for Medical Images Using Teacher–Student Model with Skip Connections and Multiscale Anomaly Consistency*. IEEE Transactions on Instrumentation and Measurement, 2024. DOI: <https://doi.org/10.1109/TIM.2024.3406792>

## CONFERENCE PAPERS

- [1] **Liu M**#, Li Y#, Zhu J#, Yang H, Huang Y, Li H, Chen Y, Bai X, Liao Y, Qu H, Tian Q\*. *FetalExtract-LLM: Structured Information Extraction in Free-Text Fetal MRI Reports Based on Privacy-Ensuring Open-weights Large Language Models*. MICCAI Workshop on Perinatal, Preterm and Paediatric Image Analysis (PIPP), 2025. (Oral) Link: [https://doi.org/10.1007/978-3-032-05997-0\\_11](https://doi.org/10.1007/978-3-032-05997-0_11)
- [2] Bai X#, **Liu M**#, Chen Y, Yang H, Tian Q\*. *Chest-OMDL: Organ-specific Multidisease Detection and Localization in Chest Computed Tomography using Weakly Supervised Deep Learning from Free-text Radiology Report*. Medical Imaging with Deep Learning (MIDL), 2025. (Poster) Link: <https://openreview.net/forum?id=ns6nq592HX>
- [3] Li H#, **Liu M**#, Bai X, Liao Y, Zheng J, Yang H, Li Z, Qu H, Tian Q\*. *FetalCSR: Multi-input Attention Fusion Network for Neural ODE-based Fetal Cortical Surface Reconstruction*. ICLR Workshop on AI for Children (ICLR AI4CHL), 2025. (Oral) Link: <https://openreview.net/forum?id=Ra0xioC3He>
- [4] Lin X#, **Liu M**#, Liu K, Chen H. *Spike-SLR: An Energy-efficient Parallel Spiking Transformer for Event-based Sign Language Recognition*. The British Machine Vision Conference (BMVC), 2024. (Poster) Link: <https://papers.bmvc2024.org/0493.pdf>
- [5] Li S#, **Liu M**#, Zhang Y, Chen S, Li H, Chen H, Dou Z. *SAM-Deblur: Let Segment Anything Boost Image Deblurring*. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2024. (Poster) Link: <https://doi.org/10.1109/ICASSP48485.2024.10445844>
- [6] **Liu M**#, Gan J#, Wen R#, Li T, Chen Y, Chen H\*. *Spiking-Diffusion: Vector Quantized Discrete Diffusion Model with Spiking Neural Networks*. International Conference on Computer, Big Data and Artificial Intelligence (ICCBD+AI), 2024. (Best paper award) Link: <https://doi.org/10.1109/ICCBD-AI65562.2024.00110>
- [7] **Liu M**, Jiao Y, Chen H\*. *Skip-ST: Anomaly Detection for Medical Images Using Student-Teacher Network with Skip Connections*. IEEE International Symposium on Circuits and Systems (ISCAS), 2023. (Oral) Link: <https://doi.org/10.1109/ISCAS46773.2023.10181639>
- [8] Lu J, **Liu M** and Chen H. *PRTMTM: A Priori Regularization Method for Tooth-Marked Tongue Classification*. IEEE International Symposium on Circuits and Systems (ISCAS), 2023. (Poster) Link: <https://doi.org/10.1109/ISCAS46773.2023.10181870>
- [9] **Liu M**, Jiao Y, Gu H, Lu J, Chen H, *Data Augmentation Using Image-to-image Translation for Tongue Coating Thickness Classification with Imbalanced Data*. IEEE Biomedical Circuits and Systems Conference (BioCAS), 2022. (Oral) Link: <https://doi.org/10.1109/BioCAS54905.2022.9948645>

## CONFERENCE SHORT PAPERS

- [1] Hao Y#, **Liu M**#, Yang H, Li H, Bai X, Liao Y, Qu H, Tian Q\*. *Comprehensive Evaluation of Unsupervised Image Enhancement for Volumetric Fetal Brain MRI*. Medical Imaging with Deep Learning (MIDL), 2025. (Poster) Link: <https://openreview.net/forum?id=RY54DHewSk>
- [2] Li Y#, **Liu M**#, Yang H, Li H, Bai X, Liao Y, Qu H, Tian Q\*. *Anatomy-guided Test-Time Adaptation for Automated Fetal Brain MRI Morphometry*. Medical Imaging with Deep Learning (MIDL), 2025. (Poster) Link: <https://openreview.net/forum?id=iLBipDelQu>
- [3] Li H#, **Liu M**#, Yang H, Liao Y, Qu H, Polimeni J. R., Tian Q\*. *Self-Supervised Cortical Surface Reconstruction for Ultra High-resolution *ex vivo* 7T MRI*. Medical Imaging with Deep Learning (MIDL), 2025. (Poster) Link: <https://openreview.net/forum?id=fn8aDbny1G>

## SELECTED CONFERENCE ABSTRACTS

- [1] **Liu M**, Li H, Li Z, Yang H, Zheng J, Qu H, Tian Q\*. *Unsupervised Fetal Brain MRI Quality Assessment based on Orientation Prediction Uncertainty*. OHBM Annual Meeting, 2025. (Poster) [OHBM Merit Award]

- [2] Hao Y, **Liu M**, Zhu J, Yang H, Liao Y, Qu H, Tian Q\*. *Unsupervised Anomaly Detection for Fetal Brain MRI using Two-Stage Denoising Autoencoder ( $\omega$ -DAE)*. OHBM Annual Meeting, 2025. (Poster)
- [3] Yang H, **Liu M**, Liao Y, Zhu J, Li H, Li Z, Zhang J, Zheng J, Li Z, Qu H, Tian Q\*. *Volume Reconstruction from Single MRI Thick-slice Stack with Deep Learning for Fetal Brain*. OHBM Annual Meeting, 2025. (Poster)
- [4] **Liu M**, Liao Y, Zhu J, Li H, Yang H, Zheng J, Li ZH, Li ZY, Qu H, Tian Q\*. *FreeHemoSeg: Label-Free Deep Learning Framework for Automated Segmentation of Fetal Brain Germinal Matrix and Intraventricular Hemorrhage*. The Annual Meeting of ISMRM, 2025. (Digital Poster)
- [5] Yang H, **Liu M**, Liao Y, Li H, Zhu J, Li Z, Zhang J, Zheng J, Li Z, Qu H, Tian Q\*. *FetalSR: Super-resolving High-isotropic-resolution Image Volume from Single Thick-slice Stack with Deep Learning for Fetal Brain Morphometry*. The Annual Meeting of ISMRM, 2025. (Oral Presentation) [Summa Cum Laude Merit Award]
- [6] Li H, **Liu M**, Liao Y, Zhu J, Zheng J, Yang H, Li Z, Qu H, Tian Q\*. *CortexKAN: Multi-input KAN for fetal cortical surface reconstruction*. The Annual Meeting of ISMRM, 2025. (Digital Poster)
- [7] Li Y, **Liu M**, Zhu J, Yang H, Zheng J, Li Z, Liao Y, Qu H, Tian Q\*. *FetalSFUDA: Source-Free Unsupervised Domain Adaptation for Fetal Brain Extraction from Different Centers or MRI Sequences*. The Annual Meeting of ISMRM, 2025. (Digital Poster)
- [8] Li Y, **Liu M**, Zhu J, Yang H, Zheng J, Li Z, Liao Y, Qu H, Tian Q\*. *BrainSFUDA: Fetal Brain Extraction from Diffusion-weighted MR Images using Source-free Unsupervised Domain Adaption*. ISMRM Workshop on 40 Years of Diffusion, 2025. (Oral Power Pitch)
- [9] **Liu M**, Li H, Zhu J, Zheng J, Yang H, Li Z, Tian Q\*. *Detecting Fetal Germinal Matrix and Intraventricular Hemorrhage in Brain MRI Using Label-free Deep Learning*. The Annual Meeting of the Radiological Society of North America (RSNA), 2024. (Oral)
- [10] **Liu M**, Li H, Li Z, Yang H, Zheng J, Zhang X, Tian Q\*. *Image Quality Assessment using an Orientation Recognition Network for Fetal MRI*. The Annual Meeting of ISMRM, 2024. (Oral Power Pitch) [Magna Cum Laude Merit Award]
- [11] Li H , **Liu M**, Zheng J, Yang H, Li Z, Tian Q\*. *FetalSurfer: an automated fetal cortex reconstruction method to study complex development of fetal brain using AI segmentation*. The Annual Meeting of ISMRM, 2024. (Digital Poster)
- [12] **Liu M** , Li H, Liao Y, Qu H, Tian Q\*. *Label-free Image Quality Assessment of Fetal Brain MRI with Unsupervised Deep Learning*. The AI Health Summit, 2023. (Oral Presentation) [Top3 prize]

## ACADEMIC SERVICE

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- Co-organizer of 2024 The Annual of Overseas Chinese Society for Magnetic Resonance in Medicine (OCSMRM)
- Journal Reviewer: EAAI; Neural Networks; Neurocomputing; IEEE TCDS; IEEE TCAS-I; IEEE TCAS-II; IEEE TIP; Applied Intelligence.
- Conference Reviewer: ACM MobileHCI 2024; AAAI-25 UC; IEEE ISBI 2025; ISMRM 2025; IJCNN 2025; CHIL 2025; MICCAI 2025; ICLR 2025 Workshop (AI4CHL, XAI4Science); ACM MM 2025; NeurIPS 2025; BMVC 2025; ICML Workshop (PUT); AAAI 2026 Workshop (XAI4Science); ICASSP 2026.
- Teaching Assistant:
  - Medical Image Processing (Undergraduate Course, 3 Units), School of Biomedical Engineering, Tsinghua University, 2024, 2025
  - TIC3: Technological Innovation and Challenges 3, Weixian College, Tsinghua University, 2024

## INVITED TALKS

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- Tsinghua Academic Path Series #724: Sharing Session with 2025 National Scholarship Awardees from the School of Biomedical Engineering Slides
- 2025 Beijing-Tsinghua Health AI Summit (Present to Editor-in-Chief of The Lancet Digital Health) Slides

- 2025 MICCAI Workshop on Perinatal, Preterm and Paediatric Image Analysis (PIPPI) Slides
- 2024 Annual Meeting of Radiological Society of North America (RSNA) Slides
- 2024 ISMRM & ISMRT Annual Meeting & Exhibition (ISMRM) Slides
- 2023 Singapore AI Health Summit Slides
- 2023 IEEE International Symposium on Circuits and Systems (ISCAS) Slides
- 2022 IEEE Biomedical Circuits and Systems Conference (BioCAS) Slides

## SKILLS

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**Programming & Python, PyTorch, TensorFlow, C/C++, Verilog, LATEX, MATLAB, Chisel, Arduino Language & Mandarin Chinese (native speaker), English**