Rizhong LIN

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Research Interests: Medical image analysis, multimodal AI and foundation models for healthcare, interpretability and explainability in deep learning, domain adaptation and robustness in medical AI, uncertainty quantification, diffusion MRI and computational neuroimaging

Education

Master of Science in Data Science *Sep. 2024 – Jul. 2026 (expected)*

École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland

- Current GPA: 5.84/6 (upon completing Spring semester 2025)
- Research Scholar in Medical Artificial Intelligence *(IC Research Scholarship)*

Bachelor of Engineering in Computer Science *Sep. 2019 – Jul. 2024*

Tongji University, Shanghai, China

- GPA: 4.76/5; *Minor* in Germanistics, GPA: 5/5
- Exchange/Visiting Year 2023–2024 at EPFL, GPA: 5.82/6
- *Thesis*: Deep Learning Algorithms for Intra-Voxel Fiber Estimation in Early Developing Brains *(Best Thesis Finalist)*

Selected Honors & Awards

- ◇ **China National Scholarship**, Ministry of Education, People's Republic of China 2023
- ◇ **EPFL IC MS Research Scholarship**, EPFL School of Computer and Communication Sciences 2024–2026
- ◇ **Shanghai Outstanding Graduate**, Shanghai Municipal Education Commission 2024
- ◇ **Best Bachelor's Thesis Finalist**, Tongji University 2024

Research Experiences

Research Scholar in AI-Powered Medical Diagnostics *Jul. 2024 – Present*

École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland *(with Mary-Anne Hartley and Martin Jaggi)*

- Developed AI models for lung auscultation diagnostics with industry partner Onescope, targeting clinical deployment
- Implemented PneumoCLIP aligning respiratory sounds with clinical text for disease detection with >84% specificity
- Designed prompt engineering strategies for clinical questionnaire analysis and evaluation using medical LLMs

Research Internship in Diffusion MRI & Brain Development *Feb. 2023 – Mar. 2024*

Centre hospitalier universitaire vaudois (CHUV), Lausanne, Switzerland *(with Meritxell Bach Cuadra and Jean-Philippe Thiran)*

- Developed deep learning algorithms for intra-voxel fiber estimation in early-developing brains using diffusion MRI
- Improved cross-domain robustness of learning-based fiber estimation by addressing age- and site-related domain shifts

Undergraduate Researcher in Medical Image Segmentation *Jan. 2022 – Dec. 2022*

Tongji University, Shanghai, China *(with Yufei Chen)*

- Developed uncertainty quantification and implemented deep learning models for multimodal tumor segmentation
- Gained interest in medical artificial intelligence applications and preliminary understanding of the field

Publications (◕/★: Joint First/Last Authors; ❀: Mentored Student)

[1] **R. Lin**◕, H. Kebiri◕, A. Gholipour, Y. Chen, J.-P. Thiran, D. Karimi and M. Bach Cuadra, "Deep learning for fODF estimation in infant brains: Model comparison, ground-truth impact and domain shift mitigation", 2025, Under major revision in *Human Brain Mapping*. doi: 10.1101/2025.04.04.647303.

[2] X. Gao◕,❀, **R. Lin**◕ *et al.*, "UFO-3: Unsupervised three-compartment learning for fiber orientation distribution function estimation", in *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, **Oral Presentation**, Sep. 2025.

[3] H. Kebiri, A. Gholipour, **R. Lin**, L. Vasung, C. Calixto, Ž. Krsnik, D. Karimi* and M. Bach Cuadra*, "Deep learning microstructure estimation of developing brains from diffusion MRI: A newborn and fetal study", *Medical Image Analysis*, vol. 95, p. 103 186, Jul. 2024. doi: 10.1016/j.media.2024.103186.

[4] **R. Lin**, A. Gholipour, J.-P. Thiran, D. Karimi, H. Kebiri* and M. Bach Cuadra*, "Cross-age and cross-site domain shift impacts on deep learning-based white matter fiber estimation in newborn and baby brains", in *IEEE International Symposium on Biomedical Imaging (ISBI)*, **Oral Presentation**, May 2024. doi: 10.1109/ISBI56570.2024.10635347.

[5] **R. Lin**, H. Kebiri, A. Gholipour, Y. Chen, J.-P. Thiran, D. Karimi and M. Bach Cuadra, "Ground-truth effects in learning-based fiber orientation distribution estimation in neonatal brains", in *MICCAI International Workshop on Computational Diffusion MRI (CDMRI)*, **Oral Presentation**, Oct. 2024. doi: 10.1007/978-3-031-86920-4_3.

[6] H. Kebiri, A. Gholipour, **R. Lin**, L. Vasung, D. Karimi* and M. Bach Cuadra*, "Robust estimation of the microstructure of the early developing brain using deep learning", in *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Oct. 2023. doi: 10.1007/978-3-031-43990-2_28.

Teaching Experiences

Tongji University, Shanghai, China

- **Advanced Language Programming (Hons)** 2020 – 2024
  Head Teaching Assistant – 220+ students, 7 semesters, introductory C/C++ programming course for CS majors
- **Data Mining** 2023
  Teaching Assistant – 100+ students, 1 semester, advanced data analysis course

Professional Skills

- **Programming:**
  - *Proficient:* Python, C/C++, MATLAB, LaTeX
  - *Familiar:* R, SQL, Bash, Java, Web (JavaScript/HTML/CSS), Scala, Qt, Verilog, x86 Assembly
- **ML Research & Applications:**
  - *Frameworks:* PyTorch (Lightning), TensorFlow (Keras), Hugging Face Transformers, scikit-learn
  - *Models & Methods:* Vision Transformers, CLIP, Diffusion Models, foundation-model fine-tuning & evaluation, prompt engineering
  - *Domains:* Medical image analysis, deep learning, computer vision, signal processing, AI in healthcare, digital health
  - *Visualization:* Matplotlib, Seaborn, Plotly, D3.js
- **Medical Imaging Tools:** MONAI, TorchIO, ITK-SNAP, 3D Slicer, FreeSurfer, MITK, FSL, Dipy, MRtrix3
- **DevOps & Workflow:** Git/GitHub, MLOps & CI/CD, Docker, HPC (Slurm, RunAI), Jupyter, VS Code, "Vibe coding"
- **Languages:** English (C1), German (B1/B2), French (B1), Mandarin Chinese (native)
- **Communication:** Scientific writing & presentation, peer review, teaching & mentoring, project management

Academic Services & Memberships

- **Reviewer:** IEEE ISBI 2025, MIDL 2025
- **Student Member:** MICCAI Society

Miscellaneous

- Main author and contributor to academic LaTeX templates, e.g. TongjiThesis and EPFLightTemplate
- Built BrightDayBot, an AI-powered Slack birthday bot that never forgets anyone's special day (unlike humans)
- *Hobbies*: language learning, slow travel, Swiss-Alps hiking, cultural excursions, coding for fun, and *most importantly* sleep
- Regular blood donor, registered bone-marrow donor, frequent volunteer subject in brain MRI studies