Khoi **Huynh**

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Research Interests

Postdoctoral scholar in Prof. Pew-Thian Yap's lab at UNC Chapel Hill, focusing on lifespan brain development through structural, functional, and diffusion MRI modeling.

Lifespan Brain Development, Diffusion MRI, Tractography, Microstructural Modeling, Brain Functional and Structural Connectivity, MR Reconstruction, Noise Removal, Brain Atlas.

Education

The University of North Carolina at Chapel Hill *Chapel Hill, North Carolina*
PhD in Biomedical Engineering *2017 – 2022*

- PI: Prof. Pew-Thian Yap.
- Dissertation: "Computational Tools For Studying Microstructural Development Of The Human Brain With Diffusion Magnetic Resonance Imaging."

International University *Hochiminh City, Vietnam*
Bachelor of Engineering in Biomedical Engineering *2012 – 2016*

- 1st class honors.

Research Experience

Prof. Pew-Thian Yap's Lab, Department of Radiology, UNC Chapel Hill *Chapel Hill, North Carolina*
Postdoctoral Scholar *2022 – Present*

- Lifespan brain development: building normative atlases of brain microstructure, connectivity, and function from birth through aging.
- Developing deep learning and deterministic computational methods for precision cortex tractography, connectome mapping, and brain parcellation.
- Advancing denoising and reconstruction techniques for high-resolution multi-contrast multi-organ imaging.
- Published in *Nature, Nature Communications, Communications Biology, Patterns, MRM*

Prof. Pew-Thian Yap's Lab, Department of Radiology, UNC Chapel Hill *Chapel Hill, North Carolina*
Graduate Research Assistant *2017 – 2022*

- Developed novel diffusion MRI methods for tissue microstructure modeling, data harmonization, and noise removal.
- Built processing pipelines for the UNC/UMN Baby Connectome Project.
- Published in *IEEE-TMI, Scientific Reports, MICCAI*

Honors & Awards

2026 **ISMRM Magna Cum Laude Awards**
2025 **Introduction to Academic Radiology for Scientists (ITARSc)** RSNA
2025 **Two ISMRM Summa Cum Laude Awards**
2025 **ISMRM Education Stipend**
2023 **UNC Radiology Symposium Best Oral Presentation**
2021 **ISMRM Education Stipend**
2020 **UNC Graduate Student Transportation Grant**
2020 **UNC-BME Travel Award**
2019 **MICCAI Graduate Student Award**
2019 **UNC-BME Travel Award**

Services

Organizer: ISMRM Workshop on 40 Years of Diffusion MRI, 2025
Journal Reviewer: Nat Neuro Sci, Nat Comms, Comms Bio, Comms Med, MRM, IEEE TMI, IEEE TCDS, IEEE TIPS, Scientific Reports, NeuroImage, PLoS ONE, Brain Structure and Function, Medical Image Analysis
Conference Reviewer: MICCAI, ISMRM, OHBM, MLMI, CDMRI
Undergraduate Honors Thesis Committee: 2025, Jiarui Mao – Department of Biostatistics, UNC Chapel Hill; 2023, Yicheng Zou – Department of Computer Science, UNC Chapel Hill

Mentoring

2026 – **Xinqi Xiong** PhD student, Department of Computer Science, UNC Chapel Hill
2024 – **Jiarui Mao** Undergraduate, Department of Biostatistics, UNC Chapel Hill

Publications

Journal

1. *The shifting landscape of brain-wide myelination across the human lifespan*. Sahar Ahmad, **Khoi Huynh**, Guoye Lin, Pew-Thian Yap. *Nature Communications, 2026*.
2. *Functional hierarchy of the human neocortex across the lifespan*. Hoyt Patrick Taylor IV, **Khoi Huynh**, Kim-Han Thung, Guoye Lin, Wenjiao Lyu, Weili Lin, Sahar Ahmad, Pew-Thian Yap. *Nature, 2026*.
3. *Anatomy-to-tract mapping infers white matter pathways without diffusion streamline propagation*. Yee-Fan Tan, **Khoi Huynh**, Siyuan Liu, Raphaël C-W Phan, Chee-Ming Ting, Pew-Thian Yap. *Nature Communications, 2025*.
4. *Functional development of the human cerebellum from birth to age five*. Wenjiao Lyu, Kim-Han Thung, **Khoi Huynh**, Li Wang, Weili Lin, Sahar Ahmad, Pew-Thian Yap. *Nature Communications, 2025*.
5. *The effective connectome over a century of human life*. Guoshi Li, **Khoi Huynh**, Kim-Han Thung, Hoyt Patrick Taylor IV, Guoye Lin, Weili Lin, Sahar Ahmad, and Pew-Thian Yap. *Communications Biology, 2025*.
6. *Optimal shrinkage denoising breaks the noise floor in high-resolution diffusion MRI*. **Khoi Huynh**, Wei-Tang Chang, Ye Wu, and Pew-Thian Yap. *Patterns, 2024*.
7. *A multimodal submillimeter MRI atlas of the human cerebellum*. Wenjiao Lyu, Ye Wu, **Khoi Huynh**, Sahar Ahmad, and Pew-Thian Yap. *Scientific Reports, 2024*.
8. *Feasibility of free-breathing 19F MRI image acquisition to characterize ventilation defects in CF and healthy volunteers at wash-in*. Sang Hun Chung, **Khoi Huynh**, Jennifer L Goralski, Yong Chen, Pew-Thian Yap, Agathe S Ceppe, Margret Z Powell, Scott H Donaldson, and Yueh Z Lee. *Magnetic Resonance in Medicine, 2023*.
9. *Deep learning prediction of diffusion MRI data with microstructure-sensitive loss functions*. Geng Chen, Yoonmi Hong, **Khoi Huynh**, and Pew-Thian Yap. *Medical Image Analysis, 2023*.
10. *Rapid Diffusion Magnetic Resonance Imaging Using Slice-Interleaved Encoding*. Tiantian Xu, Ye Wu, Yoonmi Hong, Sahar Ahmad, **Khoi Huynh**, Zhixing Wang, Weili Lin, Wei-Tang Chang, and Pew-Thian Yap. *Medical Image Analysis, 2022*.
11. *Probing Tissue Microarchitecture of the Baby Brain via Spherical Mean Spectrum Imaging*. **Khoi Huynh**, Tiantian Xu, Ye Wu, Xifeng Wang, Geng Chen, Haiyong Wu, Kim-Han Thung, Weili Lin, Dinggang Shen, and Pew-Thian Yap. *IEEE Transactions on Medical Imaging, 2020*.
12. *Multi-Site Harmonization of Diffusion MRI Data via Method of Moments*. **Khoi Huynh**, Geng Chen, Ye Wu, Dinggang Shen, and Pew-Thian Yap. *IEEE Transactions on Medical Imaging, 2019*.

Conference & Workshop (Selected)

1. *Microstructure Fingerprinting for Heterogeneously Oriented Tissue Microenvironments*. **Khoi Huynh**, Ye Wu, Sahar Ahmad, and Pew-Thian Yap. *MICCAI, 2023*

2. *Noise Mapping and Removal in Complex-Valued Multi-Channel MRI via Optimal Shrinkage of Singular Values*. **Khoi Huynh**, Wei-Tang Chang, Sang Hun Chung, Yong Chen, Yueh Lee, and Pew-Thian Yap. *MICCAI, 2021*
3. *Characterizing Intra-Soma Diffusion with Spherical Mean Spectrum Imaging*. **Khoi Huynh**, Ye Wu, Kim-Han Thung, Sahar Ahmad, Hoyt Patrick Taylor IV, Dinggang Shen, and Pew-Thian Yap. *MICCAI, 2020*
4. *Probing Brain Micro-Architecture by Orientation Distribution Invariant Identification of Diffusion Compartments*. **Khoi Huynh**, Tiantian Xu, Ye Wu, Geng Chen, Kim-Han Thung, Haiyong Wu, Weili Lin, Dinggang Shen, and Pew-Thian Yap, for the UNC/UMN Baby Connectome Project Consortium. *MICCAI, 2019*
5. *Characterizing Non-Gaussian Diffusion in Heterogeneously Oriented Tissue Microenvironments*. **Khoi Huynh**, Tiantian Xu, Ye Wu, Kim-Han Thung, Geng Chen, Weili Lin, Dinggang Shen, and Pew-Thian Yap. *MICCAI, 2019*
6. *Longitudinal Harmonization for Improving Tractography in Baby Diffusion MRI*. **Khoi Huynh**, Geng Chen, Ye Wu, Dinggang Shen, and Pew-Thian Yap. *Computational Diffusion MRI, 2018*

Abstract (Selected)

1. *Superficial white matter maturation in early childhood*. **Khoi Huynh**, Sahar Ahmad, Pew-Thian Yap. *SfN, 2026*. **Oral**
2. *Mapping Superficial White Matter Pathways in the Developing Brain*. **Khoi Huynh**, Sahar Ahmad, Pew-Thian Yap. *IST, 2026*. **Power Pitch**
3. *A White Matter Tract Atlas of Geometric and Microstructural Growth from Birth to Five Years*. **Khoi Huynh**, Wenjiao Lyu, Kim-Han Thung, Sahar Ahmad, Pew-Thian Yap. *ISMRM, 2026*. **Oral, Magna Cum Laude**
4. *Precision Cortex Tractography for the Developing Brain*. **Khoi Huynh**, Sahar Ahmad, Guoye Lin, and Pew-Thian Yap. *ISMRM, 2025*. **Oral, Summa Cum Laude**
5. *Pan-Contrast Learning of MRI Segmentation for Healthy and Anomaly Cases: Faithful to Tissue Properties and MR Physics*. Rhea Adams, Walter Zhao, Siyuan Hu, Wenjiao Lyu, **Khoi Huynh**, Sahar Ahmad, Dan Ma, and Pew-Thian Yap. *ISMRM, 2025*. **Oral, Summa Cum Laude**
6. *Longitudinal atlases of cortical and subcortical tissue microstructure in the early developing brain*. **Khoi Huynh**, Sahar Ahmad, Kim-Han Thung, Weili Lin, and Pew-Thian Yap. *OHBM, 2023*. **Oral**
7. *An Automated Processing Pipeline for Diffusion MRI in the Baby Connectome Project*. Ye Wu, Sahar Ahmad, **Khoi Huynh**, Siyuan Liu, Kim-Han Thung, Weili Lin, and Pew-Thian Yap, for the UNC/UMN Baby Connectome Project Consortium. Summa Cum Laude award. *ISMRM, 2021*. **Oral, Summa Cum Laude**.