

Junyi Wang, M.Eng.

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📍 Chengdu, Sichuan, China



Education

2023 – 📖 **M.Eng. Electronic Engineering, University of Electronic Science and Technology of China**

GPA: 3.88/4.0

Focus: Medical Image Processing

Advisor: Prof. Fan Zhang

2019 – 2023 📖 **B.Sc. Psychology, Beijing Normal University**

GPA: 3.81/4.0

Focus: Computational Neuroscience

Research Experience

Brain Registration based on white matter tractography

- 📖 Developed a novel deep learning framework for whole-brain white matter tract registration using tractography.
- 📖 Achieved state-of-the-art accuracy in inter-subject tractography alignment on multiple diffusion MRI datasets (e.g., HCP, PPMT).
- 📖 Demonstrated improved anatomical consistency in downstream analyses, such as bundle-specific tractometry and connectomics.

Real-Time Image Registration on AR Device for Surgical Navigation

- 📖 Implemented a lightweight, landmark-based registration pipeline for Apple Vision Pro to assist in intraoperative navigation.
- 📖 Achieved real-time alignment of 3D medical assets and patient anatomy in world space using C++ and Swift on visionOS.
- 📖 Open-sourced the project on GitHub: github.com/eiroW/BrainTracking

Research Experience (continued)

Cross-modality Registration for Surgical Navigation

- Designed a coarse-to-fine joint registration pipeline to align preoperative MR images with intraoperative ultrasound for brain surgery guidance.
- Applied cross-modality style transfer techniques to enhance structural correspondence and improve the robustness of SOTA registration models.
- Achieved 1st place in the Learn2Reg (ReMIND) Challenge at MICCAI 2024.

Registration-Based Prediction of Fundal Pressure for Assessing Myopia Risk



- Design a 3D registration framework to quantify structural deformation of the posterior eye wall under different pressure conditions.
- Modeled biomechanical strain from registered OCT volumes to predict fundal pressure and associated myopia risks.
- Awarded the Highest Prize in the National Challenge Cup.

Group-wise Registration for dMRI


- Proposed a group-wise registration method for aligning large-scale dMRI data across subjects.
- Improved the registration results on both healthy subjects and subjects with brain atrophy across varying ages.
- Enabled population-level studies of structural connectivity with consistent tract-level correspondence.

Research Publications

Journal Articles

- J. Wang, X. Zhu, W. Zhang, M. Du, W. M. Wells, L. J. O'Donnell, and F. Zhang, "Deep Diffusion MRI Template (DDTemplate): A Novel Deep Learning Groupwise Diffusion MRI Registration Method for Brain Template Creation," *NeuroImage*, vol. 318, p. 121401, 2025, ISSN: 1053-8119.  DOI: 10.1016/j.neuroimage.2025.121401.
- J. Gao, M. Liu, M. Qian, H. Tang, J. Wang, L. Ma, Y. Li, X. Dai, Z. Wang, F. Lu, and F. Zhang, "Fine-scale Striatal Parcellation using Diffusion MRI Tractography and Graph Neural Networks," *Medical Image Analysis*, p. 103482, 2025, ISSN: 1361-8415.  DOI: 10.1016/j.media.2025.103482.

Conference Proceedings

- J. Wang**, M. Du, Y. Wu, Y. Li, W. Wells III, L. O'Donnell, and Z. Fan, "A Novel Streamline-based Diffusion MRI Tractography Registration Method with Probabilistic Keypoint Detection," in *MICCAI 2025 (Early accepted)*, Daejeon, Korea, 2025.  DOI: 10.48550/arXiv.2503.02481.
- J. Wang**, X. Zhu, Y. Guo, Z. Wang, H. Gao, L. Zhang, and F. Zhang, "Coarse-to-Fine Joint Registration of MR and Ultrasound Images via Style Transfer," in *Workshop on Biomedical Image Registration(WBIR) at MICCAI 2024*, Marrakesh, Morocco, 2024.
- J. Wang**, X. Zhu, M. Mubai Du, W. Wells III, L. O'Donnell, and F. Zhang, "A Novel Groupwise Diffusion MRI Registration Framework Using Deep Learning," in *Abstract Book 6: OHBM 2024 Annual Meeting*, Seoul, Korea, 2024, pp. 3854–3856.
- J. Wang, B. Guo, Y. Li, **J. Wang**, Y. Chen, J. Rushmore, N. Makris, Y. Rathi, L. J. O'Donnell, and F. Zhang, "A Novel Deep Learning Tractography Fiber Clustering Framework for Functionally Consistent White Matter Parcellation Using Multimodal Diffusion MRI and Functional MRI," in *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2025.

Under Review

- Q. Qi, L. Ni, **J. Wang**, W. Zhang, X. Zhu, Y. Li, D. Cao, X. Duan, Y. Wang, and F. Zhang, *Classification of Autism Spectrum Disorder Children using Parcellation-Free Deep Learning Method (under review: Major revision)*, 2025.
- D. Cao, L. Ni, Q. Qi, L. Zhou, **J. Wang**, Y. Li, W. Zhang, J. Wei, Y. Luo, Y. Wang, F. Zhang, and S. Li, *Free Water Corrected Diffusion Magnetic Resonance Imaging Reveals Microstructural Alterations in Corpus Callosum Subregions of Preschool Children With Autism*, 2025.
- B. Guo, J. Wang, Y. Li, **J. Wang**, M. Gao, P. Feng, Y. Chen, J. Rushmore, N. Makris, Y. Rathi, L. J. O'Donnell, and F. Zhang, *DMVFC: Deep Learning Based Functionally Consistent Tractography Fiber Clustering Using Multimodal Diffusion MRI and Functional MRI (under review: Minor revision)*, 2025.

Honors

Awards and Scholarship

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| 2024 |  1st Place in ReMIND Learn2Reg 2024, Learn2Reg Challenge for Medical Image Registration, MICCAI 2024. |
| |  National Graduate Scholarship (国家奖学金, top 5%) |
| |  Highest Prize Awarded in National Challenge Cup (挑战杯: 揭榜挂帅专项赛) 2024. |
| |  MICCAI SIG-BIR Scholarship , WBIR and Learn2Reg workshop at MICCAI 2024. |
| |  Graduate Academic Scholarship , University of Electronic Science and Technology of China. |
| 2019-2020 |  Undergraduate Academic Scholarship , Beijing Normal University. |

Skills

Languages	■	Strong reading, writing and speaking competencies for English, Mandarin Chinese.
Coding	■	Python, Swift, Matlab, C++, \LaTeX , ...
Deep learning	■	Proficient in PyTorch for deep learning model training, inference, and deployment, with a focus on practical applications and optimization.
Misc.	■	Academic research, consultation, \LaTeX typesetting and publishing.