Kaibo Tang

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EDUCATION

University of North Carolina at Chapel Hill   Chapel Hill, NC
B.S.P.H. in Biostatistics, B.S. in Mathematics, and minor in Chemistry   August 2021 – Present

- **GPA (cumulative)**: **3.920**/4.0

- **Selected Courses**: Differential Equations, Linear Algebra, Advanced Calculus, Introductory Analysis, Introductory Functional Analysis, Principles of Epidemiology, Principles of Experimental Analysis, Probability and Statistical Inference, Sample Survey Methodology, Design of Public Health Studies, Image Processing and Analysis.

- **Pre-Med Courses**: Molecular Biology and Genetics, Cell and Developmental Biology, Anatomy and Physiology, General Chemistry, Analytical Chemistry, Organic Chemistry, Biological Chemistry.

- **Selected Honors and Awards**:
  - Phi Beta Kappa, 2023
  - Summer Undergraduate Research Fellowship, 2022
  - Honors Carolina
  - Accelerated Research Program

PUBLICATIONS AND MANUSCRIPTS

- **Kaibo Tang**, Zijing Dong, Lawrence L. Wald, Fuyixue Wang. Accelerated Romer-EPTI using physics-driven, joint x-q attention-network regularized reconstruction for fast mesoscale diffusion MRI. *ISMRM 2025 (power pitch).*

- Rong Lu, **Kaibo Tang**, Weijun Tang. Editorial for "Improving Accuracy and Repeatability of Cartilage T_2 Mapping in the OAI Dataset through Extended Phase Graph Modeling". *Journal of Magnetic Resonance Imaging.*

- Xiuyu Dong, Zhengwang Wu, Laifa Ma, Ya Wang, **Kaibo Tang**, He Zhang, Weili Lin, Gang Li. Cycle-consistent Learning for Fetal Cortical Surface Reconstruction. *MICCAI 2024 (early acceptance).*

- **Kaibo Tang**, Liangjun Chen, Zhengwang Wu, Fenqiang Zhao, Ya Wang, Weili Lin, Li Wang, Gang Li. Generation of Anatomy-Realistic 4D Infant Brain Atlases with Tissue Maps Using Generative Adversarial Networks. *ISBI 2024 (oral).*

RESEARCH EXPERIENCE

Acceleration of Mesoscale In-Vivo Diffusion MRI   March 2024 – Present
Supervisors: Dr. Fuyixue Wang and Dr. Zijing Dong
   A. A. Martinos Center for Biomedical Imaging, Massachussetts General Hospital and Harvard Medical School

- Explored Romer-EPTI, a novel MR sequence and reconstruction technique for in-vivo mesoscale dMRI. Studied Plug-and-Play Alternating Direction Method of Multiplier for medical image reconstruction.

- Proposed a physics-driven and deep-prior-regularized reconstruction algorithm, which affords four-fold accelerated Romer-EPTI with equivalent, if not better, image quality compared to fully sampled Romer-EPTI, achieving fast mesoscale dMRI at 500-μm isotropic resolution within 20 minutes.

Volumetric Atlas Construction for the Early Developing Brain   September 2021 – Present
Supervisor: Dr. Gang Li   Biomedical Research Imaging Center (BRIC), UNC Chapel Hill

- Explored the lab's previous work on infant brain atlas construction. Studied the challenges of applying existing deep learning-based atlas construction frameworks to fetal and infant brain MR images due to low and dynamic tissue contrast.

- Proposed a deep learning-based framework for infant brain atlas construction that 1. exploits anatomical prior from tissue probability maps to generate anatomically more plausible atlases, 2. constructs tissue probability maps that are necessary for a number of downstream tasks, and 3. accurately captures both the morphological and volumetric changes during early brain development.

- Currently working on extending the proposed framework to model fetal brain developmental trajectory by leveraging additional anatomical information from reconstructed pial and white matter surfaces.

Open Source Software Development   November 2023 – Present

- Made major contributions to MONAI, an open-source PyTorch-based deep learning framework for medical imaging maintained by NVIDIA. These contributions include a re-implementation of VoxelMorph, one of the most popular image registration frameworks, and Diffusion Loss, a popular regularizer for image registration. The added functionalities were released in MONAI 1.3.1.
- Contributed to MONAI Tutorials, including one tutorial on how to use the newly added VoxelMorph module to customize and train one's own image registration model.

Infant-Dedicated MR Image Registration   May 2022 – August 2022

Supervisor: Dr. Gang Li   Biomedical Research Imaging Center (BRIC), UNC Chapel Hill

- Conducted a preliminary study investigating the effect of leveraging auxiliary data to improve the accuracy of deep learning-based image registration for infant brain MR images. This work is supported in part by the Summer Undergraduate Research Fellowship award ($4,000) offered by the UNC Office of Undergraduate Research.

ACADEMIC SERVICE

- **Reviewer**: Medical Image Analysis (MedIA), IEEE Journal of Biomedical and Health Informatics (JBHI), MICCAI 2023, ISBI 2025
- **Lab Assistant**: Fundamentals of Human Anatomy and Physiology Laboratory (UNC Chapel Hill, since Spring 2023)

VOLUNTEERING

- **Undergraduate Volunteer**: UNC Medical Center Emergency Department (since Jan. 2023)

SKILLS

- **Languages**: Python, LaTeX, HTML, Markdown
- **Professional Softwares**: MATLAB, SAS, FreeSurfer, FSL, ANTs, ITK, Paraview
- **Others**: Git, Docker, PyTorch, TensorFlow, DIPY, MONAI

SELECTED PROJECTS, VIDEOS, AND NOTES

- **Selected projects**: See kvttt.github.io/projects, also see github.com/kvttt.
- **Videos produced**: See kvttt.github.io/videos.
- **Notes**: See kvttt.github.io/notes.