Lin Tian

Research Fellow, Harvard Medical School & Massachusetts General Hospital
ltian3@mgh.harvard.edu — (919) 590 2575 — lintian-a.github.io

RESEARCH INTERESTS

My research interests broadly lie in computer vision (2D and 3D), medical imaging, machine learning, and data science. Specifically, my research focuses on developing generalizable machine learning systems that learn **spatial relationships** directly from real-world data without annotations.

EDUCATION

University of North Carolina at Chapel Hill, North Carolina, U.S. 2019 — 2024
Ph.D. in Computer Science
Supervisor: Prof. Marc Niethammer
Thesis: Learning Generalizable Deformations From Images

University of Southern California, California, U.S. 2010 — 2012
M.S. in Computer Science

Huazhong University of Science and Technology, Hubei, China 2006 — 2010
B.Eng. in Software Engineering

RESEARCH EXPERIENCE

Massachusetts General Hospital / Harvard Medical School Boston, U.S.
Research Fellow, Supervisor: Dr. Juan Eugenio Iglesias and Dr. Matthew Rosen September 2024 — Present

- Develop medical image analysis tools for **low-field MRI** with applications to Alzheimer's and stroke disease study.
- Develop reconstruction algorithm for ***ex vivo* brain dissection photographs**.

Department of Computer Science, University of North Carolina at Chapel Hill Chapel Hill, U.S.
Research Assistant, Supervisor: Dr. Marc Niethammer August 2019 — July 2024

- **Non-rigid deformations**
  - Research on a novel approximately diffeomorphic **transformation regularization** via gradient inverse consistency, leading SOTA performance of 3D registration on Lung, Brain, and knee datasets.
  - Study on generalizable **neural deformation field** for high-resolution 3D image registration.
  - Research on **a foundation model** for 3D image registration across anatomical regions and motion patterns.
- Motion estimation between 3D and limited view 2D images
  - Research on estimating non-rigid deformations between 3D CT and limited view 2D tomosynthesis with **differentiable volume rendering**.
- 3D Reconstruction from limited-view 2D images
  - Reconstructing 3D CT from 2D tomosynthesis via differentiable projection operator and radiograph consistency.

Google X, Alphabet Inc. Mountain View, U.S.
PhD Residency, Supervisor: Dr. Alexander Zoellner, Dr. Ningrui Li and Dr. Atilla Kiraly May 2023 — August 2023

- 3D Dynamic Subject Reconstruction
  - Reconstructing 3D dynamic subject from videos using **implicit neural representation** and **neural rendering**.

Damo Academy, Alibaba Group New York, U.S.
Research Scientist Intern, Supervisor: Dr. Dakai Jin, Dr. Ke Yan and Dr. Ling Zhang May 2022 — August 2022

- Self-Supervised Pre-trained Representation
  - Conducted research on self-supervised pre-trained representation-based **point set registration** and 3D image registration, enhancing registration accuracy and efficiency.
- Optimal Transport in Feature Space
  - Investigated point set registration via optimal transport in the feature space, contributing to improved alignment and matching in 3D point clouds.

AI Lab, ByteDance Ltd. Mountain View, U.S.
Research Scientist Intern, Supervisor: Dr. Imran Saleemi May 2021 — August 2021

- 3D Shape Reconstruction and Novel View Synthesis
  - Research in 3D **shape reconstruction** and novel view synthesis from RGBD images, leveraging neural representations of **signed distance functions** (SDF) and differentiable volume rendering to advance visual computing technologies.

Ruijia Technology Inc. Wuhan, China
Machine Learning Engineer, Supervisor: Dr. Rong Yuan March 2017 — August 2019

- Transfer Learning for Brain Glioma Classification: Conducted research on using transfer learning techniques to classify brain glioma as abnormal or benign from MRI images, contributing to medical image analysis.
- Lung Nodule Detection: Implemented a state-of-the-art lung nodule detection system from CT images using faster R-CNN, improving early disease detection.

PUBLICATIONS

* Equal Contribution

Peer-reviewed Conference Paper

[1] Hastings Greer, **Lin Tian**, Francois-Xavier Vialard, Roland Kwitt, Raul San Jose Estepar, and Marc Niethammer. "CARL: A Framework for Equivariant Image Registration". In: *CVPR* (2025).

[2] Başar Demir, **Lin Tian**, Hastings Greer, Roland Kwitt, François-Xavier Vialard, Raúl San José Estépar, Sylvain Bouix, Richard Rushmore, Ebrahim Ebrahim, and Marc Niethammer. "Multigradicon: A foundation model for multimodal medical image registration". In: *International Workshop on Biomedical Image Registration* (2024).

[3] **Lin Tian**, Hastings Greer, Roland Kwitt, Francois-Xavier Vialard, Raul San Jose Estepar, Sylvain Bouix, Richard Rushmore, and Marc Niethammer. "uniGradICON: A Foundation Model for Medical Image Registration". In: *MICCAI* (2024).

[4] **Lin Tian**, Soumyadip Sengupta, Hastings Greer, Raúl San José Estépar, and Marc Niethammer. "NePhi: Neural Deformation Fields for Approximately Diffeomorphic Medical Image Registration". In: *ECCV* (2024).

[5] Hastings Greer, **Lin Tian**, Francois-Xavier Vialard, Roland Kwitt, Sylvain Bouix, Raul San Jose Estepar, Richard Rushmore, and Marc Niethammer. "Inverse consistency by construction for multistep deep registration". In: *MICCAI* (2023).

[6] Zi Li*, **Lin Tian***, Tony CW Mok, Xiaoyu Bai, Puyang Wang, Jia Ge, Jingren Zhou, Le Lu, Xianghua Ye, Ke Yan, and Dakai Jin. "Samconvex: Fast discrete optimization for ct registration using self-supervised anatomical embedding and correlation pyramid". In: *MICCAI* (2023).

[7] **Lin Tian***, Hastings Greer*, François-Xavier Vialard, Roland Kwitt, Raúl San José Estépar, Richard Jarrett Rushmore, Nikolaos Makris, Sylvain Bouix, and Marc Niethammer. "GradICON: Approximate diffeomorphisms via gradient inverse consistency". In: *CVPR* (2023).

[8] **Lin Tian**, Yueh Z Lee, Raúl San José Estépar, and Marc Niethammer. "LiftReg: Limited Angle 2D/3D Deformable Registration". In: *MICCAI* (2022).

[9] Peirong Liu, **Lin Tian**, Yubo Zhang, Stephen Aylward, Yueh Lee, and Marc Niethammer. "Discovering hidden physics behind transport dynamics". In: *CVPR* (2021).

[10] **Lin Tian**, Connor Puett, Peirong Liu, Zhengyang Shen, Stephen R Aylward, Yueh Z Lee, and Marc Niethammer. "Fluid registration between lung CT and stationary chest tomosynthesis images". In: *MICCAI* (2020).

[11] **Lin Tian** and Rong Yuan. "An automatic end-to-end pipeline for CT image-based EGFR mutation status classification". In: *Medical imaging 2019: image processing*. Vol. 10949. SPIE. 2019, pp. 695–700.

[12] Rong Yuan, **Lin Tian**, and Junhui Chen. "An RF-BFE algorithm for feature selection in radiomics analysis". In: *Medical Imaging 2019: Imaging Informatics for Healthcare, Research, and Applications*. Vol. 10954. SPIE. 2019, pp. 183–188.

In Submission

[1] **Lin Tian**, Xiaoling Hu, and Juan Eugenio Iglesias. "Test-time Uncertainty Estimation for Medical Image Registration via Transformation Equivariance". *In Submission*. 2025.

[2] **Lin Tian**, Sean I Young, Jonathan Williams Ramirez, Dina Zemlyanker, Lucas Jacob Deden Binder, Rogeny Herisse, Theresa R Connors, Derek H Oakley, Bradley T Hyman, Oula Puonti, Matthew S Rosen, and Juan Eugenio Iglesias. "Reference-Free 3D Reconstruction of Brain Dissection Photographs with Machine Learning". *In Submission*. 2025.

[3] Bhakti Baheti, Satrajit Chakrabarty, Hamed Akbari, ..., **Lin Tian**, Hastings Greer, Marc Niethammer, ..., Spyridon Bakas, and Diana Waldmannstetter. "The brain tumor sequence registration (brats-reg) challenge: Establishing correspondence between pre-operative and follow-up mri scans of diffuse glioma patients". *In Submission*. 2024.

[4] **Lin Tian***, Zi Li*, Fengze Liu, Xiaoyu Bai, Jia Ge, Le Lu, Marc Niethammer, Xianghua Ye, Ke Yan, and Daikai Jin. "SAME++: A Self-supervised Anatomical eMbeddings Enhanced medical image registration framework using stable sampling and regularized transformation". *In Submission*. 2023.

AWARDS

MIT Rising Stars in EECS (***acceptance rate: ∼21%, 70/327***) U.S., 2025
CVPR Doctoral Consortium with NSF Travel Award (***acceptance rate: ∼18%, 41/231***) U.S., 2025
Best Oral Presentation, MICCAI WBIR Marrakech, 2024
MICCAI Travel Award Singapore, 2022
Scholarship of Citizen, Huazhong University of Science and Technology (*top 1%*) China, 2007-2008
China National Scholarship, Ministry of Education (***top 0.2% nationwide***) China, 2006-2007
Outstanding Student, Huazhong University of Science and Technology (*top 1%*) China, 2006-2007

ACADEMIC SERVICES

Area Chair
MICCAI 2025

Conference Reviewer
CVPR, ECCV, ICCV, MICCAI, AAAI

Journal Reviewer
Medical Image Analysis
IEEE Transactions on Medical Imaging
IEEE Transactions on Pattern Analysis and Machine Intelligence
Pattern Recognition

MENTORSHIP

Wenzhu Ye	2025—2026	M.Sc.	Harvard University	Co-mentored with Prof. Iglesias on super-resolution models for dental imaging
Zhaoxi Zhang	2023—2024	M.Sc.	UNC Chapel Hill	Reconstructing CT from Single-view and Biplanar X-Rays
Yueliang Ying	2023—2024	M.Sc.	UNC Chapel Hill	Reconstructing CT from Single-view and Biplanar X-Rays

OTHER EXPERIENCES

Lilith Games Shanghai, China
Virtual Reality Game Producer | PongIt!VR (Steam) May 2015 — Feb 2017
Senior Game Designer | Soul Hunters (iOS & Android), Most profitable game in China 2014

Netease Games Hangzhou, China
System Designer | My Love from the Star (iOS & Android) June 2014 — May 2015

Disney Interactive Media Group Los Angeles, U.S.
Game Development Engineer June 2012 — May 2014

- Stack Rabbit (iOS & Android)
- Where's My Water (iOS & Android), 2012 Apple Design Award

REFERENCES

Prof. Marc Niethammer
Professor, Department of Computer Science, University of California San Diego, San Diego, U.S.
E-mail: mniethammer@ucsd.edu
Scholar Profiles: Google Scholar

Prof. Juan Eugenio Iglesias
Associate Professor, Department of Radiology, Massachusetts General Hospital & Harvard Medical School, Boston, U.S.
E-mail: JIGLESIASGONZALEZ@mgh.harvard.edu
Scholar Profiles: Google Scholar