

YINING JIAO



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Summary

Postdoctoral Scholar at UCSD specializing in **interpretable biomedical data analysis**. I develop rigorous statistical machine learning frameworks to tackle fundamental challenges in healthcare, focusing on **atlas construction**, **geometry processing**, and **spatiotemporal modeling**. My work leverages theoretical insights from **identifiability** and **uncertainty quantification** to build robust, trustworthy AI models for disentangling disease-related variation and enabling personalized inference. **Core strengths:** Interpretability, Atlas Construction, Geometry Processing, Spatiotemporal Modeling, Uncertainty Quantification, Information Geometry, Scientific Visualization.



Education

The University of North Carolina at Chapel Hill

Ph.D. in Computer Science

Jan 2021 – Dec 2025

Chapel Hill, NC, U.S.

Shanghai Jiao Tong University

M.S. in Biomedical Engineering

Sep 2017 – Mar 2020

Shanghai, China

Northwestern Polytechnical University, Honors College

B.Eng. in Electronic Science and Technology

Sep 2013 – Jun 2017

Xi'an, Shaanxi, China



Experience

University of California, San Diego (UCSD)

Postdoctoral Scholar

Jan 2026 – July 2026

San Diego, CA, U.S.

- ♦ **Information-Geometric Disentanglement:** Developing identifiable frameworks using **Information Geometry** to rigorously decompose and jointly quantify the spatiotemporal effects and uncertainty of distinct covariates (e.g., aging vs. disease progression).
- ♦ **Individualized Neural Shape Prediction:** Designing implicit shape representations capable of **individualized shape prediction**, enabling precise, patient-specific anatomical forecasting and personalized intervention planning.

The Biomedical Image Analysis Group at UNC-Chapel Hill

Research Assistant, Advisor: Prof. Marc Niethammer

Jan 2021 – Dec 2025

Chapel Hill, NC, U.S.

- ♦ **Pediatric Airway Shape Analysis:** Developed and maintained the whole image processing pipeline for pediatric airway shape analysis, including the deep-learning-based automatic image segmentation, landmark detection, geometry processing, and visualizations of diseased and normal pediatric airways for medical discoveries.
- ♦ **Airway OCT Segmentation and Geometry Reconstruction:** Developed the first learning-based system to extract 3D geometries from airway OCT scans, by benchmarking *UNets* and *transformers* on the OCT segmentation task; and then implemented 3D geometry reconstruction from the airway point clouds, leading to **< 46 μm reconstruction error** while significantly reducing the workload of creating extensive manual segmentations.
- ♦ **Interpretable 3D Shape Modeling:** Developed interpretable neural implicit shape representations for scientific shape analysis; implemented experiments to validate the *state-of-the-art performance* and versatile capabilities of the proposed method; designed visualizations of the learned atlas; wrote up and published it in a top machine learning conference.
- ♦ **Uncertainty-Aware Spatiotemporal Learning:** Built *LucidAtlas*, a unified probabilistic atlas framework that, with a single model, tackles diverse shape analysis tasks—covariate interpretation, individualized prediction, longitudinal growth modeling, variance estimation, and out-of-distribution detection. Introduced marginalization theory to handle incomplete covariates, making large-scale interpretable analysis practically feasible.
- ♦ **Uncertainty Quantification in 3D Shape Representation:** Developing *PRISM*, the first framework to model uncertainty in neural implicit shape representations. It establishes probabilistic inference for 3D geometries, disentangles covariate effects, and integrates time-warping for spatiotemporal analysis—pioneering uncertainty-aware implicit modeling in computational anatomy.

United Imaging Intelligence

Research Intern, Mentor: Dr. Zhong Xue and Prof. Dinggang Shen

Oct 2019 – May 2020

Shanghai, China

- ♦ **Kaggle Challenge** Applied EfficientNet for the hemorrhage detection for Kaggle RSNA Intracranial Hemorrhage Detection Challenge, awarded silver medal (top 4% of 1k+ teams).

The Medical Image Computing Lab at Shanghai Jiao Tong University

Research Assistant, Advisor: Prof. Qian Wang

Sep 2017 – Mar 2020

Shanghai, China

- ♦ **cuRadiomics** Developed a CUDA-based tool for fast computation of Radiomics features, boosting the computational efficiency by **100 \times** .
- ♦ **Data Science for Cancer Research.** Applied *statistical analysis*, *survival analysis*, and *machine learning models* for treatment outcome prediction of prostate cancer and osteosarcoma, cervical cancer classification, diagnosis of Parkinson's disease, etc; summarized the discoveries and published several journal papers.

Computer Science Department at Northwestern Polytechnical University

Research Assistant, Advisor: Prof. Wei Wei and Prof. Lei Zhang

May 2016 – Jun 2017

Xi'an, Shaanxi, China

- ♦ **Convex Optimization for Image Denoising** Implemented a method based on convex optimization for hyperspectral image denoising; conducted quantitative and qualitative evaluations to prove its *state-of-the-art performance*.

Selected Publications

* indicated equal contribution

Yining Jiao, Marc Niethammer et al. PRISM: A 3D Probabilistic Neural Representation for Interpretable Shape Modeling. *Manuscript in preparation*.

Yining Jiao, Marc Niethammer et al. LucidAtlas: Learning Uncertainty-Aware, Covariate-Disentangled, Individualized Atlas Representations. *Under Review*.

Yining Jiao, Marc Niethammer et al. NAISR: A 3D Neural Additive Model for Interpretable Shape Representation. *ICLR 2024. Spotlight (top 5%)*. [\[DEMO\]](#)

Qin Liu, Zhenlin Xu and **Yining Jiao** and Marc Niethammer. iSegFormer: Interactive Segmentation via Transformers with Application to 3D Knee MR Images. *MICCAI 2022*.

Shuang Wu*, **Yining Jiao*** et al. Imaging-Based Individualized Response Prediction of Carbon Ion Radiotherapy for Prostate Cancer Patients. *Cancer Management and Research*, September 2019.

Hongjun Song*, **Yining Jiao*** et al. Can pretreatment 18F-FDG PET tumor texture features predict the outcomes of osteosarcoma treated by neoadjuvant chemotherapy? *European Radiology*, July 2019.

Yining Jiao, Oihane Mayo Ijurra et al. cuRadiomics: A GPU-based Radiomics Feature Extraction Toolkit. *MICCAI 2019 Workshop. Oral, top 10 of submitted papers*.






Skills

Programming: Python, C/C++, CUDA, Git, Scripting (Bash), LaTeX

Software: PyTorch, Tensorflow, ITK, scikit-learn, Pandas, Linux

Language: English (fluent), Chinese (native)

Honors

 ICML Workshop on Computational Biology Fellowship	2021
 Outstanding Graduate of Shanghai (only 4 from department)	2020
 SJTU Excellent Graduate Student Award (only 2 from the department)	2019
 Silver Medal, Kaggle RSNA Intracranial Hemorrhage Detection Challenge	2019
 Excellent Undergraduate Thesis in NWPU	2017

Academic Activities

Journal Reviews: IEEE Journal of Biomedical and Health Informatics, Neural Networks, IEEE Transactions on Pattern Analysis and Machine Intelligence.

Conference Reviews: ICCV 2021, CVPR 2022, ICCV 2023, MICCAI2024, NeurIPS2024, WACV2025, CVPR2025, ICLR2025, ICML2025, NeurIPS2025, AAAI2026.