

# Yining Jiao (Ina)

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## I Research Highlights

I am a postdoc Scholar at UCSD. I build AI that knows what it knows — and recognizes what it doesn't. My research focuses on spatiotemporal representation learning, with a dedication to interpretability and uncertainty quantification within the healthcare domain. My work revolves around three questions:

- ⌚ Learning to see shapes — advanced techniques for image and geometry processing.
- 👤 Learning to model populations — representing how anatomical shapes vary and evolve.
- 📊 Learning to say "I don't know" — statistical machine learning for robust uncertainty quantification.

## I Education

2020–2025	<b>Ph.D. in Computer Science, UNC-Chapel Hill</b> Advisor: Prof. Marc Niethammer
2017–2020	<b>M.S. in Biomedical Engineering, Shanghai Jiao Tong University</b> Advisor: Prof. Qian Wang
2013–2017	<b>B.Eng. in Electronic Sci. &amp; Tech., Northwestern Polytechnical Univ., Honors College</b>

## I Research Experience

2026–Present	<b>Postdoctoral Scholar, UC San Diego</b> Advisor: Prof. Marc Niethammer <ul style="list-style-type: none"><li>➤ Individualized spatiotemporal learning; uncertainty quantification for shapes.</li></ul>
2020–2025	<b>Research Assistant, Biomedical Image Analysis Group, UNC-Chapel Hill</b> Advisor: Prof. Marc Niethammer <ul style="list-style-type: none"><li>➤ <b>Pediatric Airway Shape Analysis:</b> Developed and maintained the full image processing pipeline — deep-learning-based segmentation, landmark detection, geometry processing, and clinical visualization of pediatric airways.</li><li>➤ <b>Airway OCT Segmentation &amp; Reconstruction:</b> First learning-based system to extract 3D geometries from airway OCT scans; benchmarked UNets and transformers; <math>&lt; 46 \mu\text{m}</math> reconstruction error.</li><li>➤ <b>Interpretable 3D Shape Modeling:</b> Developed interpretable neural implicit shape representations for scientific shape analysis. <b>ICLR 2024 Spotlight · top 5%</b></li><li>➤ <b>Uncertainty-Aware Spatiotemporal Learning:</b> Built LucidAtlas, a by-construction interpretable atlas framework for modeling spatially varying data with covariates — supporting individualized prediction, population trend analysis, and OOD detection in a single model. Introduced marginalization theory to interpret dependent covariates.</li><li>➤ <b>Temporal Uncertainty for 3D Shapes:</b> Developed PRISM, a probabilistic implicit shape representation that estimates spatially varying temporal uncertainty in closed form by exploiting automatic differentiation on implicit fields — no massive sampling, just a single forward pass. A single model for shape evolution, developmental time inference, personalized prediction, and anomaly detection.</li></ul>
2019–2020	<b>Research Intern, United Imaging Intelligence, Shanghai</b> Mentor: Dr. Zhong Xue & Prof. Dinggang Shen. Applied EfficientNet for Kaggle RSNA Intracranial Hemorrhage Detection Challenge — <b>silver medal (top 4%, 1,345 teams)</b> .
2017–2020	<b>Research Assistant, Medical Image Computing Lab, SJTU</b> Advisor: Prof. Qian Wang <ul style="list-style-type: none"><li>➤ <b>cuRadiomics:</b> Developed a CUDA-based tool for fast computation of Radiomics features, <b>100× speedup</b>. <b>RNO-AI 2019 Oral · top 10</b></li></ul>

- **Data Science for Cancer Research:** Applied statistical analysis, survival analysis, and machine learning for treatment outcome prediction; published in *European Radiology, Cancer Mgmt. & Research*.

2016–2017

**Research Assistant, Northwestern Polytechnical University**Advisors: Prof. Wei Wei & Prof. Lei Zhang. Implemented convex optimization for hyperspectral image denoising; published in *IEEE Trans. Geoscience and Remote Sensing*.**I Selected Publications**

1. Y.Jiao et al. “PRISM: A 3D Probabilistic Neural Representation for Interpretable Shape Modeling.” *Preprint*, 2026.
2. Y.Jiao et al. “LucidAtlas: Learning Uncertainty-Aware, Covariate-Disentangled, Individualized Atlas Representations.” *Under Review*, 2025. [\[Paper\]](#)
3. Y.Jiao et al. “NAISR: A 3D Neural Additive Model for Interpretable Shape Representation.” *ICLR 2024*. Spotlight · top 5%  
[\[Paper\]](#) [\[Demo\]](#) [\[Code\]](#)

**I Other Publications**

\* equal contribution

4. Q. Liu, Z. Xu, Y.Jiao, M. Niethammer. “iSegFormer: Interactive Segmentation via Transformers with Application to 3D Knee MR Images.” *MICCAI 2022*. [\[Paper\]](#)
5. W. Wei, L. Zhang, Y. Jiao et al. “Intracluster Structured Low-Rank Matrix Analysis Method for Hyperspectral Denoising.” *IEEE Trans. Geoscience and Remote Sensing*, 2018. [\[Paper\]](#)
6. S. Wu\*, Y. Jiao\* et al. “Imaging-Based Individualized Response Prediction of Carbon Ion Radiotherapy for Prostate Cancer.” *Cancer Mgmt. and Research*, 2019. [\[Paper\]](#)
7. H. Song\*, Y. Jiao\* et al. “Can pretreatment 18F-FDG PET tumor texture features predict osteosarcoma chemotherapy outcomes?” *European Radiology*, 2019. [\[Paper\]](#)
8. Y.Jiao et al. “cuRadiomics: A GPU-based Radiomics Feature Extraction Toolkit.” *MICCAIRNO-AI 2019*. Oral · top 10  
[\[Paper\]](#) [\[Code\]](#)

**I Technical Skills****Programming** Python · C/C++ · CUDA · Git · Bash · L<sup>A</sup>T<sub>E</sub>X**ML / Scientific** PyTorch · TensorFlow · scikit-learn · Pandas · NumPy · SciPy**Imaging / 3D** ITK · VTK · SimpleITK · Open3D · trimesh · 3D Slicer · ParaView**Languages** English (fluent) · Chinese (native)**I Honors & Awards**

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| 2021 | ICML Workshop on Computational Biology Fellowship                     |
| 2020 | Outstanding Graduate of Shanghai (4 from department)                  |
| 2019 | SJTU Excellent Graduate Student Award (2 from department)             |
| 2019 | Kaggle RSNA Hemorrhage Detection Silver Medal (top 4%, 1,845 teams)   |
| 2017 | Excellent Undergraduate Thesis, Northwestern Polytechnical University |

**I Academic Services****Conference Reviewer:** CVPR, ICCV, ECCV, NeurIPS, ICML, ICLR, AISTATS, AAAI, WACV, MICCAI**Journal Reviewer:** IEEE TPAMI, IEEE JBHI, Neural Networks