

# Yining Jiao (Ina)

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## 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.

## Education

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

## Research Experience

- 2026–Present **Postdoctoral Scholar, UC San Diego**  
Advisor: Prof. Marc Niethammer
  - Individualized spatiotemporal learning; uncertainty quantification for shapes.
- 2020–2025 **Research Assistant, Biomedical Image Analysis Group, UNC-Chapel Hill**  
Advisor: Prof. Marc Niethammer
  - **Pediatric Airway Shape Analysis:** Developed and maintained the full image processing pipeline — deep-learning-based segmentation, landmark detection, geometry processing, and clinical visualization of pediatric airways.
  - **Airway OCT Segmentation & Reconstruction:** First learning-based system to extract 3D geometries from airway OCT scans; benchmarked UNets and transformers;  $< 46 \mu\text{m}$  reconstruction error.
  - **Interpretable 3D Shape Modeling:** Developed interpretable neural implicit shape representations for scientific shape analysis. **ICLR 2024 Spotlight · top 5%**
  - **Uncertainty-Aware Spatiotemporal Learning:** 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.
  - **Temporal Uncertainty for 3D Shapes:** Developed PRISM, a probabilistic implicit shape representation that estimates spatially varying temporal uncertainty in **closed form** by exploiting automatic differentiation on implicit fields — **no sampling, single forward pass**. A single model for shape evolution, developmental time inference, personalized prediction, and anomaly detection.
- 2019–2020 **Research Intern, United Imaging Intelligence, Shanghai**  
Mentor: Dr. Zhong Xue & Prof. Dinggang Shen. Applied EfficientNet for Kaggle RSNA Intracranial Hemorrhage Detection Challenge — **silver medal (top 4%, 1,345 teams)**.
- 2017–2020 **Research Assistant, Medical Image Computing Lab, SJTU**  
Advisor: Prof. Qian Wang
  - **cuRadiomics:** Developed a CUDA-based tool for fast computation of Radiomics features, **100×** speedup. **RNO-AI 2019 Oral · top 10**

- **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*.

## | 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%](#)  
[\[Paper\]](#) [\[Demo\]](#) [\[Code\]](#)

## | 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. "Intracuster 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." *MICCAI RNO-AI 2019*. [Oral · top 10](#)  
[\[Paper\]](#) [\[Code\]](#)

## | 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)

## | 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%, 1,345 teams)   |
| 2017 | Excellent Undergraduate Thesis, Northwestern Polytechnical University |

## | Academic Services

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