# Xingjian Zhang

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## Education

**École Polytechnique, Institut Polytechnique de Paris**

Ph.D. candidate in Biomedical Engineering (AI bioimaging) — 2023 - Present
- Advisors: Abdul I. Barakat (École Polytechnique), Elsa D. Angelini (Télécom Paris)
- Expected completion - late 2026 / early 2027

M.S. in Mechanics - Biomechanics and Biomedical Engineering — 2021 - 2023

B.S. in Computer Science and Mathematics — 2018 - 2021

## Experience

**PhD candidate** | *LadHyX, École Polytechnique & LTCI, Télécom Paris* — Nov 2023 - Present
- **Applying** deep learning techniques to microscopy imaging data to quantify cellular nuclear deformations on microgroove substrates, developing end-to-end ML pipelines from model training to inference deployment, advancing in-vitro diagnostic capabilities for laminopathies and breast cancer
- **Clinical collaborations** with Marie Lannelongue Hospital surgeons and medtech startups (Sensome, EloCare) yielding clinically-adopted workflows and published biomedical sensing research
- **Teaching and supervision** at Télécom Paris and École Polytechnique: TA for master-level courses (ML, DL, Medical Imaging, Object Recognition) and supervised M2 research projects on computer vision topics

**AI Research Intern** | *Dassault Systèmes* — Mar 2023 - Sep 2023
- **Developed** 3D deep learning models (CNN and transformer-based) for automated tumor segmentation on volumetric CT scans, trained on multi-GPU clusters for large-scale experimentation
- **Enhanced** existing 2D segmentation workflows by introducing fully volumetric architectures, improving 3D spatial consistency and model generalization in production systems

**Research Intern** | *LOB, École Polytechnique* — Apr 2022 - Mar 2023
- **Developed** segmentation algorithms and computational workflows for pSHG and THG microscopy imaging
- **Developed** *BioImageLoader*, a Python library that streamlines large-scale bioimage data loading for ML pipelines

## Publications

### Peer-reviewed Publications

- MC Yagüe, X Zhang, et al., "Noninvasive real-time monitoring of cellular spatiotemporal dynamics via machine learning-enhanced electrical impedance spectroscopy", ***Science Advances***, 2025.
- C Leclech, G Cardillo, B Roellinger, X Zhang, et al., "Microscale topography triggers dynamic 3D nuclear deformations", ***Advanced Science***, 2025.
- A Hauguel, K Kasani, V Chevance, X Zhang, et al., "Changes in ascending aorta and aortic arch secondary flow patterns following endovascular repair", *Eur J Vasc Endovasc Surg*, 2025.
- B Asadipour, E Beaurepaire, X Zhang, et al., "Modeling and predicting second harmonic generation from protein molecular structure", ***Physical Review X***, 2024.
- X Zhang, C Leclech, et al., "Myoblast mutation classification via microgroove-induced nuclear deformations", *MIDL*, 2024.
- G Pogudin, X Zhang, "Interpretable exact linear reductions via positivity", *CMSB*, 2021.

### Pre-prints / under review

- B Asadipour, R Ronzano, J Morizet, X Zhang, et al., "Label-free multimodal non-linear microscopy to probe metabolism and myelin distribution"
- S Lim, X Zhang, et al., "BioImageLoader: Easy handling of bioimage datasets for machine learning"

## Selected Presentations

- "Deep learning classification of laminopathy mutations on microgroove substrates", *ESB 2025 Congress*, Zürich, Switzerland (Oral)
- "Myoblast mutation classification via microgroove-induced nuclear deformations", *MIDL 2024*, Paris, France (Poster)
- "Interpretable exact linear reductions via positivity", *CMSB 2021*, Bordeaux, France (Oral)

## Skills

**Programming:** Python, Julia, R, Matlab, C/C++, JavaScript/HTML/CSS
**ML and MLOps Tools:** Pytorch, TensorFlow, JAX, Git, Docker, PySpark, SQL, Pandas, Multi-GPU training
**Tools:** NIS-Elements, ImageJ/FIJI, Icy, CellProfiler, ITK, 3D Slicer, Imaris, ParaView, MONAI, DICOM/NIFTI/HDF5/ND2 formats
**Languages:** Chinese (native), English (C2), French (B2)