Xingjian Zhang

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Research Interests

AI/ML methods in computer vision for bioimaging and medical imaging. Experience with GANs, diffusion models, and self-supervised learning approaches. Interested in applying AI to different bio/medical imaging modalities and research.

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)

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, advancing in-vitro diagnostic capabilities for laminopathies and breast cancer.
- **Contributed to** collaborative research projects across domains including 4D flow MRI modeling and ML on tabular surgery data (Marie Lannelongue Hospital), time-series electrical impedance data (Sensome), and skin conductance data (EloCare, NUS).
- **Teaching** assistance in master-level (Deep Learning, Medical Imaging, Object Recognition) and bachelor-level (Machine Learning, Web Programming) courses at Télécom Paris and École Polytechnique.
- **Supervised** M2 research projects on computer vision topics at Télécom Paris.

Research Engineer Intern | *Dassault Systèmes* — Mar 2023 - Sep 2023
- **Conducted** deep learning research in 3D tumor segmentation on CT scan data for the TwinOnco project, advancing beyond existing methods that relied on 2D slice segmentation and aggregation.

Research Intern | *LOB, École Polytechnique* — Apr 2022 - Mar 2023
- **Developed** segmentation algorithms and computational models for pSHG and THG imaging.
- **Developed** BioImageLoader, a Python library providing a unified interface for bioimage datasets in machine learning applications.

Publications

Peer-reviewed

- M. C. Yagüe, X. Zhang, M. Volpatti, Y. Wei, G. Lebedev, J. Gamby, A. I. Barakat, "Noninvasive real-time monitoring of cellular spatiotemporal dynamics via machine learning-enhanced electrical impedance spectroscopy", *Science Advances (IF 13.7)*, 2025.
- C. Leclech, G. Cardillo, B. Roellinger, X. Zhang, J. Frederick, K. Mamchaoui, C. Coirault, A. I. Barakat, "Microscale topography triggers dynamic 3D nuclear deformations", *Advanced Science (IF 14.1)*, 2025.
- A. Hauguel, K. Kasani, V. Chevance, X. Zhang, A. I. Barakat, S. Haulon, A. Azarine , "Changes in ascending aorta and aortic arch secondary flow patterns following endovascular repair of the descending thoracic aorta", *European Journal of Vascular and Endovascular Surgery (IF 6.8)*, 2025.
- B. Asadipour, E. Beaurepaire, X. Zhang, A. Chessel, P. Mahou, W. Supatto, M. C. Schanne-Klein, C. Stringari, "Modeling and predicting second harmonic generation from protein molecular structure", *Physical Review X (IF 15.7)*, 2024.
- X. Zhang, C. Leclech, B. Roellinger, C. Coirault, E. D. Angelini, A. I. Barakat, "Myoblast mutation classification via microgroove-induced nuclear deformations", *International Conference on Medical Imaging with Deep Learning*, 2024.
- G. Pogudin, X. Zhang, "Interpretable exact linear reductions via positivity", *International Conference on Computational Methods in Systems Biology*, 2021.

Pre-prints / under review

- B. Asadipour, R. Ronzano, J. Morizet, X. Zhang, A. Chessel, P. Mahou, M. Aigrot, B. Stankoff, A. Desmazieres, E. Beaurepaire, C. Stringari, "Label-free multimodal non-linear microscopy to probe metabolism and myelin distribution in organotypic cerebellar slices", 2024.
- S. Lim, X. Zhang, E. Beaurepaire, A. Chessel, "BioImageLoader: Easy handling of bioimage datasets for machine learning", 2023.

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
Languages: Chinese (native), English (C2), French (B2)