

Xin-Yang Liu

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EXPERIENCE

- **Meta** Menlo Park, CA, USA
 - Research Scientist Facebook Reels, *Nov 2025 - Present*
Video Generation, Post-training (SFT, RL)
 - Research Scientist Meta Superintelligence Lab, *Jun 2025 - Nov 2025*
Image generation, Auto evaluation

EDUCATION

- **University of Notre Dame** Notre Dame, IN, USA
 - *Ph.D. - Mechanical Engineering* *Jan 2020 - May 2025*
 - **Research focus:** AI4Science, Neural Operator, GenAI, Computational Fluid Dynamics (CFD)
- **Xi'an Jiaotong University** Xi'an, Shannxi, China
 - *Bachelor of science - Energy & Power Engineering* *Aug 2015 - June 2019*

SELECTED PUBLICATIONS

- **Liu, X. Y.**, Parikh, M.H., Fan, X., Du, P., Wang, Q., Chen, Y.F. and Wang, J.X., 2024. [CoNFILD-inlet: Synthetic Turbulence Inflow Using Generative Latent Diffusion Models with Neural Fields](#). *Physical Review Fluids*, 10(5), p.054901.
- **Liu, X.Y.**, Zhu, M., Lu, L., Sun, H. and Wang, J.X., 2024. [Multi-resolution partial differential equations preserved learning framework for spatiotemporal dynamics](#). *Communications Physics*, 7(1), p.31.
- **Liu, X.Y.**, Bodaghi, D., Xue, Q., Zheng, X. and Wang, J.X., 2024. [Asynchronous parallel reinforcement learning for optimizing propulsive performance in fin ray control](#). *Engineering with Computers*, pp.1-18.
- **Liu, X.Y.** and Wang, J.X., 2021. [Physics-informed Dyna-style model-based deep reinforcement learning for dynamic control](#). *Proceedings of the Royal Society A*, 477(2255), p.20210618.
- Movahhedi, M.*, **Liu, X.Y.***, Geng, B., Elemans, C., Xue, Q., Wang, J.X. and Zheng, X., 2023. [Predicting 3D soft tissue dynamics from 2D imaging using physics informed neural networks](#). *Communications Biology*, 6(1), p.541.
- Du, P., Parikh, M.H., Fan, X., **Liu, X.Y.** and Wang, J.X., 2024. [Conditional neural field latent diffusion model for generating spatiotemporal turbulence](#). *Nature Communications*, 15(1), pp.1-22.
- Fan, X., **Liu, X.Y.**, Wang, M., and Wang, J.X., 2025. [Diff-FlowFSI: A GPU-Optimized Differentiable CFD Platform for High-Fidelity Turbulence and FSI Simulations](#). *Computer Methods in Applied Mechanics and Engineering*, 448, p.118455.
- Feng, Z., **Liu, X.Y.**, Parikh, M.H., Guo, J., Du, P., Yan, B. and Wang, J.X., 2025. [Generative Latent Diffusion Model for Inverse Modeling and Uncertainty Analysis in Geological Carbon Sequestration](#). *arXiv preprint arXiv:2508.16640*.
- Wang, Q. , Ren, P., Zhou, H., **Liu, X.Y.**, Liu, Y., Deng, Z., Zhang Y., Chengze, R., Liu, H., Wang, Z., Wang, J.X., Wen, J.R., Sun, H., 2024. [P²C²Net: PDE-Preserved Coarse Correction Network for efficient prediction of spatiotemporal dynamics](#). *Advances in Neural Information Processing Systems*, 37, pp.68897-68925.
- **Liu, X.Y.**, Fan, X., and Wang, J.X., 2026. [MuRFiV: A Multi-Resolution Finite-Volume Inspired Deep Learning Framework for Spatiotemporal Dynamics](#) In preparation, [Presented at Crunch seminar](#)

CONFERENCE PRESENTATIONS

- **Liu, X.Y.**, Parikh, M., Fan, X., Du, P., Wang, J.X. Generative Latent Diffusion Model for Spatiotemporal Inflow Turbulence SIAM Computational Science and Engineering, Mar. 2025
- **Liu, X.Y.**, Fan, X., Wang, M. and Wang, J.X. Diff-FlowFSI: A GPU-accelerated, JAX-based Differentiable CFD Solver for Turbulent Flow and Fluid-Structure Interactions American Physical Society Division of Fluid Dynamics (APS DFD), Nov. 2024
- **Liu, X.Y.**, Fan, X., Wang, J.X. Integrating PDE Operators into Neural Network Architecture in A Multi-Resolution Manner for Spatiotemporal Prediction USACM Thematic Conference on Uncertainty Quantification for Machine Learning Integrated Physics Modeling (UQ-MLIP), Aug. 2024
- **Liu, X.Y.**, Fan, X., Wang, J.X. MuRFiV-Net: A Multi-Resolution Finite-Volume Inspired Neural Network for Predicting Spatiotemporal Dynamics APS DFD, Nov. 2023
- **Liu, X.Y.**, Wang, J.X. Multi-Resolution and Finite-Volume Method inspired Neural Network (MuRFiV-Net) for PDE prediction International Congress on Industrial and Applied Mathematics (ICIAM), Aug. 2023
- **Liu, X.Y.**, Wang, J.X. Predicting parametric spatiotemporal dynamics by multi-resolution pde structure-preserved deep learning APS DFD, Nov. 2022
- **Liu, X.Y.**, Sun, H., Wang, J.X. Predicting parametric spatiotemporal dynamics by multi-resolution PDE structure-preserved deep learning Society of Engineering and Science, Oct. 2022
- **Liu, X.Y.**, Bodaghi, D., Zheng, X., Xue, Q., Wang, J.X. Off-Policy Reinforcement Learning for Finsh-Fin-Ray Control Trained in an Asynchronous Parallel Manner UQ-MLIP, Aug. 2022
- **Liu, X.Y.**, Bodaghi, D., Zheng, X., Xue, Q., Wang, J.X. Accelerating deep reinforcement learning with physics-informed models and asynchronous parallel training Society for Industrial and Applied Mathematics Uncertainty Quantification (SIAM UQ), Apr. 2022
- **Liu, X.Y.**, Bodaghi, D., Zheng, X., Xue, Q., Wang, J.X. Deep reinforcement learning for fish fin ray control APS DFD, December 2021
- **Liu, X.Y.**, Wang, J.X. Physics-informed Dyna-Style Model-Based Deep Reinforcement Learning for Dynamic Control. SIAM Annual Meeting, Jul. 2021

HONORS AND AWARDS

- USACM Thematic Conference on Uncertainty Quantification for Machine Learning Integrated Physics Modeling (UQ-MLIP) Travel Award Aug., 2024
- Society of Engineering Science Annual Technical Meeting (SES2022) funding support Oct., 2022
- USACM Thematic Conference on Uncertainty Quantification for Machine Learning Integrated Physics Modeling (UQ-MLIP) Travel Award Aug., 2022
- 16th U.S. National Congress on Computational Mechanics Conference Award May., 2021

SKILLS

- **Coding:** Python (Pytorch, Jax), Julia, Matlab, C++, CUDA