Zixuan Lu

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Introduction

During my undergraduate studies, I developed a strong foundation in applied mathematics and mechanics, supported by extensive training in engineering and computer science. Building on this, my graduate studies expanded my expertise to encompass computer graphics and high-performance computing, with a focus on research in physics-based animation and simulation. I am passionate about advancing my knowledge in computer graphics and leveraging advanced programming techniques to bring innovative ideas to the community.

Educational Background

University of Utah, Karlet School of Computing,
Graphics and visualization track, *Ph.D. in pursuit*. Supervisor: Prof. Yin Yang. 2024.8-Present

Institute of Software, CAS & University of Chinese Academy of Sciences,
Applied Computer Science, *M.S.* 2021.9-2024.6

- Academic Scholarship (2021, 2022), First Class Academic Scholarship (2023), Merit Student (2023)
- Thesis: Projective Peridynamics Modeling For Hyperelasitic Codimensional Body Simulation With Contact Handling, supervised by Prof. Xiaowei He, Xueyang Zhu and Xuehui Liu at Institute of Software, CAS.

University of Chinese Academy of Sciences, Theoretical and Applied Mechanics
(Yonghuai Guo Mechanics Experimental Class), *B.Eng.* 2017.9-2021.6

- Yonghuai Guo Honorary Scholarships (2020, 2021)
- Graduation Project: Simplified Model and CFD Simulation of Vascular Bypass Surgery, supervised by Prof. Shizhao Wang at the Institute of Mechanics, CAS.

Internship

Lightspeed Studios, Tencent America LLC, Los Angeles 2026.2-Present

- Research intern. Supervised by Kui Wu.
- Ongoing project: High-fidelity hair strands generation.

Style3D Research, Hangzhou 2024.4-2024.8

- Research intern. Supervised by Zhendong Wang.
- Project: Rig-driven 4D garment synthesis.

University of Utah, Karlet School of Computing, Salt Lake City 2023.10-2024.4

- Research assistant. Supervised by Prof. Yin Yang.
- Project: Real-time GPU cloth solver based on Projective Dynamics.

Publication

Journal and Conference proceeding

- **Zixuan Lu***, Ziheng Liu* (joint first authors), Lei Lan, Huamin Wang, Yuko Ishiwaka, Chenfanfu Jiang, Kui Wu, and Yin Yang. 2025. High-performance CPU Cloth Simulation Using Domain-decomposed Projective Dynamics. ACM Trans. Graph. 44, 4, Article 51 (August 2025), 17 pages. https://doi.org/10.1145/3731182. [Project page]
- Lei Lan, **Zixuan Lu**, Chun Yuan, Weiwei Xu, Hao Su, Huamin Wang, Chenfanfu Jiang, and Yin Yang. 2025. JGS2: Near Second-order Converging Jacobi/Gauss-Seidel for GPU Elastodynamics. ACM Trans. Graph. 44, 4, Article 44 (August 2025), 15 pages. https://doi.org/10.1145/3731183 .
- Lei Lan, Tianjia Shao, **Zixuan Lu**, Yu Zhang, Chenfanfu Jiang, and Yin Yang. 2025. 3DGS2: Near Second-order Converging 3D Gaussian Splatting. In Special Interest Group on Computer Graphics and Interactive Techniques Conference Conference Papers (SIGGRAPH Conference Papers ' 25), August.10–14, 2025, Vancouver, BC, Canada. ACM, 10 pages. https://doi.org/10.1145/3721238.3730687. [Project page]
- Lei Lan, **Zixuan Lu**, Jingyi Long, Chun Yuan, Xuan Li, Xiaowei He, Huamin Wang, Chenfanfu Jiang, and Yin Yang. 2024. Efficient GPU Cloth Simulation with Non-distance Barriers and Subspace Reuse. ACM Trans. Graph (SIGGRAPH Asia). 43, 6, Article 226 (December 2024), 16 pages. https://doi.org/10.1145/3687760.

- **Zixuan Lu**, Xiaowei He, Yuzhong Guo, Xuehui Liu, and Huamin Wang, Projective Peridynamic Modeling of Hyperelastic Membranes With Contact, in IEEE Transactions on Visualization and Computer Graphics, vol. 30, no. 8, pp. 4601-4614, Aug. 2024, doi: 10.1109/TVCG.2023.3271511.
- **Zixuan Lu**, Hao He, Di Wu, Xuehui Liu, Virtual Fiber-based Constitute Model for Anisotropic Material Design[J]. Journal of Computer-Aided Design & Computer Graphics, 2024.
- **Zixuan Lu**, Liang Guo, and Hongyu Zhao. Mechanics of Nonbuckling Interconnects with Prestrain for Stretchable Electronics. Appl. Math. Mech.-Engl. Ed. 42, 689−702 (2021). https://doi.org/10.1007/s10483-021-2715-7.

Patent

- Xiaowei He, **Zixuan Lu**, Xuehui Liu, A Semi-implicit Iterative Simulation Method for Hyperelastic Material Based on Peridynamics, CN116187147B, Authorized.

Skills

- **Code Language**: C/C++ (advanced), CUDA (advanced), Python3, MATLAB, CMake
- **DCC tools**: Houdini (advanced)
- **Language**: Chinese (native), English

Highlight Project

- **Preidyno** group member (previously). Mainly be responsible for the development of hyperelastic solver, hyperelastic membrane solver and collision handling module. [Public repo]

Invited Talk

Utah graphics seminar, University of Utah 2025.9

- Topics: Static and Dynamic Reordering for Physics-based Simulation. [Download]

GAMES Webinar Series 380 2025.9

- Topics: High-performance CPU Cloth Simulation Using Domain-decomposed PD. [Download]

2025 PhD Student Lecture on Social Robotics, Xiamen University, CDMC 2025.12

- Topics: High-performance CPU Cloth Simulator.

Award

- Best SIGGRAPH Technical Paper Award, **Honorable Mention**, SIGGRAPH 2025, Vancouver, BC, Canada.
- Image and Graphics Technology Challenge of China Society of Image and Graphics (CSIG) 2023, Real-time Fluid Particle Physics Simulation Animation and Optimization Track, **Second Place**.