

Litian Zhang

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RESEARCH INTERESTS

Physics-based Simulation, Numerical Optimization





EDUCATION

- **University of Hong Kong** May 2026 – present
PhD student in CDS, supervisor: Taku Komura Hong Kong
- **Tsinghua University** Sep 2020 – Jun 2025
B.S. in Mechanics & B.E. in Civil Engineering Systems Beijing

EXPERIENCE

- **Multimedia Lab, École de technologie supérieure**  Jun 2023 – Sep 2023
Mitacs Globalink Intern Advisor: **Eric Paquette**
 - Investigated **texture synthesis** for time-varying 3D fluids.
 - Applied **diffusion models** to generate textures on liquid surfaces undergoing large deformations.
 - Designed neural networks to generate seamless textures in UV coordinates, improving **temporal coherence and fidelity**.
- **Visual Computing and Learning Lab, Peking University**  Nov 2023 – Jun 2025
Research Intern Advisor: **Mengyu Chu**
 - Replicated **1D/2D shallow water simulation** and implemented solid–fluid coupling.
 - Studied Monte Carlo methods for **free-surface fluids**; designed interface-aware treatments for signed distance field (SDF) reinitialization.
 - Implemented the **Walk on Stars** algorithm for pressure Poisson solves and explored mixed boundary conditions (**Dirichlet/Neumann**).
- **Computer Graphics and Visualization Lab, The University of Hong Kong**  Jul 2025 – Apr 2026
Research Assistant Advisor: **Taku Komura**
 - Implemented an **implicit Material Point Method (MPM) solver** with Newton’s method, enabling larger stable time steps than explicit solvers.
 - Accelerated computation using **C++ CPU multithreading**.
 - Developing fast **MAS preconditioners** and strong coupling with **Incremental Potential Contact (IPC)** for robust collision handling.

PROJECTS

- **SPH Solver** Oct 2023
Implemented a WCSPH solver in C++ with OpenGL visualization. Repo
- **Eulerian Fluid Solver** Nov 2023
Implemented a grid-based Eulerian solver in C++ with level set free-surface tracking. Repo
- **Codimensional Incremental Potential Contact for Cloth** Jun 2024
Implemented C-IPC for collision handling in cloth simulation. Repo
- **Walk on Stars Solver with Free Surface** Jun 2025
Implemented Walk on Stars solvers for FLIP/Eulerian/MPM discretizations in free-surface simulation. Repo
- **Unified Implicit MPM Solver** Nov 2025
Built an implicit MPM solver based on Newton’s method, supporting elasticity, plasticity, and fluids.

HONORS & AWARDS

- **Mitacs Globalink Research Internship Award** Feb 2023
Mitacs Globalink, Canada
 - Competitive program pairing **top-ranked international students** with Canadian faculty supervisors.
 - Awarded a **fully funded 12-week research internship** (travel and living support).
- **Award for Comprehensive Excellence** Sep 2021
Tsinghua University
 - School-level scholarship recognizing **top-ranking students** through nomination and evaluation.
 - Considered academic excellence alongside **leadership and community contribution**.

SKILLS

- **Programming Languages:** C, C++, Python, C#, MATLAB
- **Tools & Technologies:** Git, \LaTeX , CMake, Xmake, Blender
- **Tests:** TOEFL 109 (S 23, W 28), GRE 329 (V 159, Q 170, AWA 3.5)