

Taiyuan Zhang

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Education

Dartmouth College

Hanover, New Hampshire, U.S.

M.S. IN COMPUTER SCIENCE (THESIS TRACK)

2023 - present

- Advisor: Prof. Bo Zhu

Nankai University

Tianjin, China

B.E. IN COMPUTER SCIENCE

2018 - 2022

- Advisor: Prof. Bo Ren
- Thesis: "Learning-based Advection Error Correction Network for Fluid Simulation Accelerating"

Publications

PUBLISHED

Jinjin He, **Taiyuan Zhang**, Hiroki Kobayashi, Atsushi Kawamoto, Yuqing Zhou, Tsuyoshi Nomura, Bo Zhu. *Multi-level Partition of Unity on Differentiable Moving Particles*. ACM Transactions on Graphics, 43, 6, Article 273, December 2024 (Proceedings of SIGGRAPH ASIA 2024).

Bo Ren*, Xiaohan Ye* (joint 1st authors), Zherong Pan, **Taiyuan Zhang**. *Versatile Control of Fluid-Directed Solid Objects Using Multi-Task Reinforcement Learning*. ACM Transactions on Graphics, 42, 2, Article 15, October 2022.

Research Experience

Shanghai Qi Zhi Institute

Shanghai, China

Research Intern, advised by Prof. Tao Du

Summer 2024

- Devise a parametric curve-based spacetime solver to maximize computing resource efficiency and accelerate simulations.

Georgia Institute of Technology

Georgia, U.S.

Research Intern (remote), advised by Prof. Bo Zhu

2023 - present

- Devise a level set method and surface tension model for the Particle Flow Maps method to simulate fluid with a free surface.
- Devise adaptive particle-based representations for dynamic implicit geometries and multiple differentiable tasks.

Nankai University, TMCC

Tianjin, China

Research Assistant, advised by Prof. Bo Ren

2022 - 2023

- Devise particle-based algorithms to simulate freezing dynamics on thin films, such as freezing soap bubbles.
- Devise an Eulerian-Lagrangian method for small-scale multi-phase fluid simulation.

Nankai University, TMCC

Tianjin, China

Research Intern, advised by Prof. Bo Ren

2021 - 2022

- (Bachelor's thesis) Devise an advection error correction convolutional neural network to accelerate fluid simulation.
- Implement fluid solvers (WCSPH, PCISPH, MPM, etc.) for multi-task reinforcement learning with coupled fluid-solid objects.

Nankai University, TMCC

Tianjin, China

Research Intern, advised by Prof. Ming-Ming Cheng

2019 - 2020

- Post overviews of *Nonlinear Regression via Deep Negative Correlation Learning* (TPAMI) on the China Society of Image and Graphics (CSIG) official account, with 2000+ views.
- Lead a team to 25th place out of 983 in the Zhengtu Cup Campus Machine Vision AI Competition, detecting defects in industrial parts using an encoder-decoder model.

Honors & Awards

2023-2025 Merit-based scholarship

Dartmouth College

2019 “Global Nankai” scholarship

Nankai University

2018 **Second Place in High School Students Mathematics Contest in China**
Third Place in High School Students Physics Contest in China

Teaching Experience

Fall 2024 **COSC 77/277 Computer Graphics** Teaching Assistant

Dartmouth College

- Host TA and x-hour sessions; deliver a talk on particle systems and grad programming assignments, readings, and quizzes.

Spring 2024 **COSC 70 Foundations of Applied Computer Science** Teaching Assistant

Dartmouth College

- Host TA sessions and grad programming assignments, readings, and quizzes.

Winter 2024 **COSC 74/274 Machine Learning and Statistical Data Analysis** Teaching Assistant

Dartmouth College

- Host TA sessions and grad programming assignments and quizzes.

Skills

- **Programming languages:** C/C++/C#, Python, Java, JavaScript, GLSL
- **Software/Library:** Pytorch, Taichi, CUDA, Warp, Blender, Paraview, Houdini, Unity, Adobe Photoshop, Adobe Illustrator, Adobe Effects, Adobe Premiere
- **Language:** Chinese (native), English (fluent)