Taiyuan Zhang

HB 6211, Dartmouth College, Hanover, NH 03755
taiyuan.zhang.gr@dartmouth.edu | https://taiyuan-zhang.github.io/ | https://github.com/Taiyuan-Zhang

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 **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)