

# Mengdi Wang

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🌐 <https://wang-mengdi.github.io/>    in mengdi-wang-cg    🌐 wang-mengdi

## Introduction

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I am a PhD student at Georgia Tech in the School of Interactive Computing, majoring in Computer Science with a research focus on physics-based simulation, advised by Prof. Bo Zhu. I received my Bachelor degree of Computer Science at Peking University in 2020, advised by Prof. Baoquan Chen.

My overarching research goal is to empower diverse fields such as scientific discovery, video generation AI, and game visual effects through high-performance, large-scale GPU-based physical simulations. To this end, my work involves the development of novel numerical algorithms for simulating both large-scale physical phenomena on GPUs and complex geometric fluids, leading to multiple publications at top venues including SIGGRAPH and the Journal of Computational Physics (JCP).

## Education

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| <b>Georgia Institute of Technology</b> , PhD of Computer Science                       | 2024.1 - 2026.6(exp) |
| ◦ School of Interactive Computing, area: Computer Graphics                             |                      |
| ◦ Advisor: Prof. Bo Zhu  |                      |
| <b>Dartmouth College</b> , PhD of Computer Science                                     | 2020.9 - 2023.12     |
| ◦ Advisor: Prof. Bo Zhu  |                      |
| <b>Peking University</b> , Bachelor of Science ( <i>summa cum laude</i> )              | 2016.9 - 2020.6      |
| ◦ School of EECS, research assistant in CFCS(Center on Frontiers of Computing Studies) |                      |
| ◦ Advisor: Prof. Baoquan Chen  |                      |

## Work Experience

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| <b>Research Intern</b><br>TikTok Inc.  | San Jose, CA<br>2025.5 - 2025.8    |
| ◦ Simulation-guided physically-accurate video generation model.  |                                    |
| ◦ Mentor: Yili Zhao  |                                    |
| <b>Research Intern</b><br>Lightspeed Studio, Tencent America   | Los Angeles, CA<br>2024.5 - 2024.8 |
| ◦ Developed a knit fabric simulation algorithm based on yarn-crossing representation and optimization through physically inspired energy, enabling real-time simulation. |                                    |
| ◦ Published the work as a co-first author paper to SIGGRAPH 2025.  |                                    |
| ◦ Mentor: Kui Wu   |                                    |
| <b>Research Intern</b><br>NVIDIA Corps   | Santa Clara, CA<br>2022.6 - 2022.9 |
| ◦ Developed a GPU-based high-performance geometric multigrid Poisson solver and a VOF-based interface tracking algorithm.  |                                    |
| ◦ Published the results to the Journal of Computational Physics (JCP).   |                                    |
| ◦ Mentors: Ken Museth, Eftychios Sifakis, Matthew Cong   |                                    |

## Publications

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|---|---------------|
| <b>Cirrus: Adaptive Hybrid Particle-Grid Flow Maps on GPU</b> | SIGGRAPH 2025 |
| <i>Mengdi Wang</i> , Fan Feng, Junlin Li, Bo Zhu              |               |
| <b>Real-Time Knit Deformation and Rendering</b>               | SIGGRAPH 2025 |

*Mengdi Wang\**, Tao Huang\*, Haoyang Shi\*, (joint first authors), Yuxing Qiu, Yin Yang, Kui Wu

**An Interface Tracking Method with Triangle Edge Cuts** JCP 2025.1

*Mengdi Wang*, Matthew Cong, Bo Zhu

**Hydrophobic and Hydrophilic Solid-Fluid Interaction** SIGGRAPH ASIA 2022

Jinyuan Liu, *Mengdi Wang*, Fan Feng, Annie Tang, Qiqin Le, Bo Zhu

**A moving eulerian-lagrangian particle method for thin film and foam simulation** SIGGRAPH 2022

Yitong Deng, *Mengdi Wang*, Xiangxin Kong, Shiyong Xiong, Zangyueyang Xian, Bo Zhu

**A Clebsch method for free-surface vortical flow simulation** SIGGRAPH 2022

Shiyong Xiong, Zhecheng Wang, *Mengdi Wang*, Bo Zhu (Featured on video trailer)

**Thin-film smoothed particle hydrodynamics fluid** SIGGRAPH 2021

*Mengdi Wang*, Yitong Deng, Xiangxin Kong, Aditya H. Prasad, Shiyong Xiong, Bo Zhu (Featured in video trailer)

**Visual data analysis and simulation prediction for COVID-19** arXiv preprint 2020

Baoquan Chen, Mingyi Shi, Xingyu Ni, Liangwang Ruan, Hongda Jiang, Heyuan Yao, *Mengdi Wang*, Zhenhua Song, Qiang Zhou, Tong Ge

## Presentations

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**A moving eulerian-lagrangian particle method for thin film and foam simulation** Aug. 2022

SIGGRAPH 2022, in-person

**Thin-film smoothed particle hydrodynamics fluid** Dec. 2021

212th Graphics and Mixed Environment Seminar (GAMES Webinar, Virtual, Invited Speaker)

**Thin-film smoothed particle hydrodynamics fluid** Aug. 2021

SIGGRAPH 2021, in-person

## Skills

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C/C++, CUDA, Python, MatLab, LATEX, OpenGL, Rendering, Machine Learning, Data Structures, Linux Shells.

## Awards and Honors

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**Kwang-Hua Scholarship** 2017-2018

Academic Year of 2017-2018

**Peking University Programming Contest** 2017

Second Prize (Rank 7th)

**Award of Scientific Research** 2016-2017

Academic Year of 2016-2017

**Lee Wai Wing Scholarship** 2016-2017

Academic Year of 2016-2017

**ACM-ICPC Asia QingDao Regional Contest** 2016

Gold Medal (Rank 4th)

**18th National Olympiad in Informatics** 2015

Gold Medal (Rank 11th)