Haoyang Wu

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EDUCATION

Nanjing University — Nanjing, Jiangsu, China
Computer Technology (Non Degree Awarded) — Sep. 2023 – Sep. 2024

Shandong University — Jinan/Qingdao, Shandong, China
B.Eng. in Computer Science and Technology — Sep. 2019 – Jun. 2023

RESEARCH EXPERIENCE

The University of Texas at Dallas — Dallas, Texas, USA
Remote Research Intern (Supervisor: Prof. Xiaohu Guo) — Aug. 2024 – Present
Topic: Reconstruct mesh from SDF by training a neural network to optimize the sample positions and radii.
Responsibilities: Algorithm design; Prototyping; System implementation; Empirical analysis.

INDEPENDENT PROJECTS

Physics Based Renderer | C++ — 2024
Feature: ray tracing; diffuse, metal, dielectrics materials.

Material Point Methods (MPM) for Snow Simulation | C++, CUDA — 2024
Achieved a GPU-accelerated realistic 3D snow simulation by implementing MPM with CUDA.
Features: PIC, FLIP, APIC; BSpline interpolation; Explicit integration; Real-time, offline rendering.

Incompressible Eulerian Fluid Simulation | C++ — 2024
Achieved a realistic 2D smoke simulation in free air using the Eulerian method.
Features: Semi-Lagrangian advection; Marker-and-cell method; Incompressible assumption.

Finite Element Method & Mass-spring System for Elastic Simulation | C++ — 2024
Achieved a interactive elastic 3D simulation without contact
Features: Semi-implicit integration, Newton's method for optimization; High-resolution rendering for low-resolution simulation via skinning.

Geometry Modeling and Processing Algorithms Implementation | C++, Houdini — 2024
Topics: *Poisson surface reconstruction* on a regular grid; *Registration* using rigid matching; *Heat method* for *geodesic distance* estimation; Basic discrete exterior calculus operators on triangle mesh.

Metamorphic Testing of Satisfiability Modulo Theories (SMT) Solvers | Python — 2023
Reproduced results from two relevant top papers in a unified way by implementing the automatic testing code where the core component is an interpreter of a domain-specific language (DSL) I designed.

SKILLS

Programming: C/C++, Python, CUDA; CMake, Git.

Software & Library: Blender, Houdini; Eigen, libigl, CGAL, PyTorch.

SERVICES

Winter Computer Science Course for Women — Online, China
Organizer, Lecturer — Jan. 2021 – Mar. 2021
Designed a more accessible and attractive material for female students from non-science background. It received positive feedback and inspired more students to study CS.

Network Management Committee — Qingdao, Shandong, China
Student Member — Oct. 2020 — Dec. 2021
Communicated with diverse people and staff to identify and resolve network issues.

HONORS AND AWARDS

Academic Scholarship (top 10% & 15%) — 2020 – 2024
Shandong University & Nanjing University

First Prize (top 2%) — 2021
Contemporary Undergraduate Mathematical Contest in Modeling