

Haoyang Wu

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SUMMARY

I am seeking research opportunities in computer graphics, scientific computing and related fields!

Computer science student with experience in graphics and parallel programming, especially simulation and geometry. Current research focus is reconstructing explicit surface mesh from signed/unsigned distance field. Additional experience includes designing a domain-specific language and developing its compiler.

EDUCATION

Shandong University

GPA: 3.814/4.000 *Bachelor of Engineering in Computer Science | Economics*

Qingdao, Shandong

Sep. 2019 – June 2023

RESEARCH EXPERIENCE

Remote Research Assistant

The University of Texas at Dallas

Aug. 2024 – Present

Supervisor: Prof. Xiaohu Guo

- Research topic: reconstruct high-quality explicit surface mesh from signed/unsigned distance field, especially with low resolution grid.
- Develop a framework for investigating the problem and visualizing each stage of the algorithms.
- Propose methods and conduct experiments to validate our ideas and compare the outcomes.

SELECTED PROJECTS

Physics Based Rendering (Darts framework) | C++

Aug. 2024 – Present

- Naive ray tracing; Material: diffuse, metal, & dielectrics

Physics Based Simulation | C++, CUDA, Houdini, Eign, Matlab

Apr. 2024 – July 2024

- **Three-Dimensional Material Point Method** simulator accelerated on GPU using **CUDA**; PIC, FLIP & APIC; BSpline interpolation & Explicit integration; OpenGL (online rendering) & OpenVDB + Houdini (offline rendering)
- **Two-Dimensional incompressible Eulerian fluid** (smoke in the open air) simulator; Semi-Lagrangian advection; Marker-and-cell (MAC) method: staggered grid
- Interactive simulation of a single deformable object using **finite element method** and **mass-spring system**; Semi-implicit integration & Optimization algorithm (Newton's method); Simulate low-resolution & render high resolution meshes via skinning

Geometric Modeling and Processing (Assignments) | C++, libigl, Houdini, Python

May 2024 – July 2024

- Poisson surface reconstruction on regular grid; Registration using point-point and point-plane rigid matching
- Ray-mesh, mesh-mesh intersection and point cloud distance queries using bounding volume hierarchy data-structure
- Visualize Laplacian harmonic functions on mesh; Calculate geodesic distance using heat method
- Basic combinatorial surface operators: star, closure, boundary and link; Basic discrete exterior calculus operators: Hodge star and exterior derivative on 2D manifold

SKILLS

Programming: C/C++, Python, Matlab, CUDA, LaTeX, Java

Softwares: Houdini, Blender

Developer Tools: CMake, Git, Vim

Libraries: Eigen, libigl, CGAL, OpenGL

Language: English (B2-C1), Chinese/Mandarin (Native)

STANDARDIZED TESTS

English: TOEFL iBT 102

Others: GRE General Test 331