Haomiao Wu

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EDUCATION

Yale University, New Haven, CT   09/2021 - Present
Ph.D., Department of Computer Science
Selected Courses: Physics Simulation for Movies and Games, Advanced Topics in Computer Graphics

Tsinghua University, China
B.S., Mathematics and Physics: 09/2017 - 07/2021
Selected Courses: Fundamentals of Computer Graphics

RESEARCH EXPERIENCE

Computer Graphics Group, Yale University, *Graduate Researcher*   09/2021-present
· Project: Tiled Eigenfluids, Advisor: Prof. Theodore Kim
Experimented with efficient mathematical representations of fluid simulation. Built high-quality fluid animation with a variety of boundaries.
· Project: Eigensystem Analysis for Strand Simulation, Advisor: Prof. Theodore Kim
Used mathematical methods to analyze the dynamics of strand simulation. Provided physical interpretation of the elastic motion and robust simulation.

The Graphics and Geometric Computing Group, Tsinghua University, *Undergraduate Researcher*   05/2019-06/2021
· Project: Gradient Domain Monte Carlo Path Tracing Denoising, Advisor: Prof. Kun Xu
Implemented the denoising of MCMC rendered images and gradient domain images. Reconstructed the final images using the unsupervised CNN. Made improvement compared to previous methods with low-SPP images.

The Graphics and Imaging Laboratory, University of Washington, *Summer Research Intern*   06/2020-10/2020
· Project: Fabrication Oriented Design Optimization, Advisor: Prof. Adriana Schulz
Designed the method to generate design variations. Implemented plug-ins for FreeCAD, and designed interfaces for the optimization pipeline to access the parametrized design data and geometric constraints. Paper: "Co-Optimization of Design and Fabrication Plans for Carpentry", ACM Trans. Graph. 41, no.3 (2022).

PROJECTS

Cloth Simulator   04/2022-05/2022
Implemented a cloth simulator from scratch using C++ with implicit integration, supporting stretching, shearing, and bending forces, collision detection and response.

Path Tracing Renderer   02/2019-06/2019
Implemented a renderer from scratch using C++, supporting global illumination, acceleration hierarchy, mesh simplification, etc.

TECHNICAL SKILLS

Programming Languages: C/C++, Python, Java, shell, Matlab, Mathematica, Haskell, LaTeX.
Software Tools: Matlab, Mathematica, FreeCAD, MeshLab, OpenGL, Eigen, FFTW, PyTorch, Android Studio, renderers including Mitsuba, Tungsten and Blender