

# Jerry Hsu

## University of Utah, PhD Student

✉ Jerry060599@gmail.com

🐙 github.com/jerr060599

🌐 chichenghsu.com

### Education

#### Computer Science, PhD Student

University of Utah, GPA 4.00

Advisor: Prof. Cem Yuksel, Utah Graphics Group

Focus on computer graphics and simulations

2020 ~ current

#### Computer Science, B.S.

#### Mathematics, B.S.

Purdue University, GPA 3.81

2017 ~ 2020

### Work Experience

#### Research Intern

##### Tencent Lightspeed & Quantum Studios

2022 Summer

- Performed research, implementation, and experimentation on state-of-the-art hair simulation methods.
- **Sag-free initialization** of said simulation performed by the inverse solve of hair rest configurations to counter sagging due to gravity.

#### Research Intern

##### Adobe Computational Artistry Team (CAT)

2021 Summer

- Performed research through mathematical derivation to implementation and experimentation.
- **Intelligent adaptive splitting**: A representation independent way of optimizing over discrete parameters in vector graphics.
- Currently working on publishing.

#### Software Engineering Intern

##### Amazon Commerce Platform

2019 Summer

- Implemented diagnostic data processing on cloud systems for bill computation.
- Designed data chunking systems that reduced network transfer usage by 70% when accessed.

### Technical

- Languages: C & C++, CUDA, GLSL/HLSL, C#, Mathematica, Matlab
- Familiar with: OpenGL, eigen3, SCS, ipopt, Intel MKL/Pardiso

### Research & Publications

#### *Physically based hair interpolation*

Tencent Lightspeed & Quantum Studios, 2023 – Present

- Fast and efficient hair interpolation that incorporates the advantages of neural interpolation while being well suited for real-time applications.

#### **ACM SIGGRAPH 2023: Sag Free Initialization for Complex Hair Simulations**

Tencent Lightspeed & Quantum Studios, 2022 – 2023

[graphics.cs.utah.edu/research/projects/sag-free-hair/](https://graphics.cs.utah.edu/research/projects/sag-free-hair/)

- Jerry Hsu, Tongtong Wang, Zherong Pan, Xifeng Gao, Cem Yuksel, and Kui Wu. 2023. Sag-Free Initialization for Strand-Based Hybrid Hair Simulation. ACM Trans. (August 2023)
- A continuation of the above work on sag-free initializations with the goal of addressing sag on complex hair simulations with full collision, friction, and many thousands of individual guide hairs.
- Hair simulation using XPBD Cosserat Rods coupled to a MPM continuum friction model.

#### **ACM SIGGRAPH 2022: A general two-stage initialization for sag-free deformable simulations**

University of Utah, 2020 – 2022

[graphics.cs.utah.edu/research/projects/sag-free-simulations](https://graphics.cs.utah.edu/research/projects/sag-free-simulations)

- Jerry Hsu, Nghia Truong, Cem Yuksel, and Kui Wu. 2022. A general two-stage initialization for sag-free deformable simulations. ACM Trans. (July 2022)
- Physically based simulations often suffer from sagging on initialization due to naïve assumptions on rest state and material parameters. This often requires artists to compensate manually and perform costly warmup simulations.
- This is a general framework to efficiently solve for sag free initializations applicable to cloth, FEM, MPM, and PBD based simulations.

#### **Intelligent Adaptive Splitting for Vector Representations**

Adobe, 2021 - Present

- Currently working on publication.
- Discrete parameters like the number of nodes in a Bezier curve are often optimized through handcrafted heuristics.
- This provides a theoretically sound and generalizable framework to intelligently perform discrete node additions (or splitting) on vector representations like splines, diffusion curves, or gradient meshes.
- Applications include curve fitting, image fitting, and adaptive simulations.