

# Alvin Shi

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## Education

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### YALE UNIVERSITY, NEW HAVEN, CT | *EXPECTED 2027*

- Ph.D, Computer Science | Supervised by Theodore Kim

### UNIVERSITY OF CHICAGO, CHICAGO, IL | 2021

- BS, Mathematics | Minors in Physics and Media Arts and Design – 3.98/4.00 GPA – Summa Cum Laude

## Experience

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### YALE COMPUTER GRAPHICS LAB | RESEARCH ASSISTANT | SEPT 2021 – PRESENT

- Implemented and analyzed the use of DCT/DST speedups in model-reduction for fluid simulations
- Refined pipeline for converting symbolic integration evaluators into workable C++ functions and classes
- Reformulated collision energies to accelerate flesh and cloth simulation

### CENTER FOR COLLABORATIVE ARTS AND MEDIA | FELLOW | JAN 2022 – PRESENT

- Developed and debugged interactive game development demos for first-time-coders in Unity
- Launched CCAM Discord channel for collaboration with student game development organizations and community outreach initiatives

### THE MYSTERY LEAGUE | DEVELOPER | MAR 2021 – JUN 2021

- Implemented AR-System for Geographical walkaround puzzle involving 13 geolocations, image-scanning, and independently made high-fidelity 3D Blender models
- Co-developed phone tree traversal puzzle, text adventures, and playtested other multimedia ARGs involving assets made in YouTube, Blender, and the Unity game engine

### HACK ARTS LAB | LAB ASSISTANT | SEPT 2019 – MAR 2020

- Instructed collaborators and patrons on proper use of 3D printers, programmable sewing machines, laser cutters, and power tools
- Collaborated with other assistants to create posters, stickers, patches, and music-playing systems for the Media Arts, Data, and Design Center

## Projects & Skills

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### CODING

- C, C++, C#, Python, JavaScript, Mathematica, MATLAB
- *Shader Experiments* leverages the GPU to create real-time 2D fluid simulations with an Eulerian solver that incorporates vorticity confinement, obstacle handling with iterated orthogonal projection, and visualization options for density cutoffs and velocity coloring.
- *HOBAC Mod* is an addition to Theodore Kim's HOBAC simulator for deformable flesh and cloth. By reformulating the square-root vertex-face energy, the computational resources spent on solving for self-collisions goes down 50%.

### GAME DEVELOPMENT

- Unity, Blender, GameMaker Studio
- *Cube All* is an independently developed game where the player uses click-and-drag mouse controls to propel a cube through a procedurally generated 3D landscape packed with dangerous terrain. Made in Unity, *Cube-All* is playable on desktop and mobile devices.