Alvin Shi

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Research Interests

Computer graphics and simulation, with particular focus on abstract phenomena and artist-centered tools and algorithms. Applications in world models, movies, and games.

Education

Yale University, New Haven, CT 2021 - 2027 (Expected)
Ph.D. in Computer Science, supervised by Prof. Theodore Kim
Dissertation: “Geometric Modelling for Efficient Simulation"
Committee: Theodore Kim, Julie Dorsey, Holly Rushmeier

University of Chicago, Chicago, IL 2017 - 2021
BS Mathematics, Minors in Physics and Media Arts and Design.
3.98/4.00 GPA. *Summa Cum Laude*

TJHSST, Alexandria, VA 2013 - 2017

Publications

[1] Shi, A., Bertails, F., Darke, A. M., & Kim, T. (2026). Curvature Space Editing of Highly-Coiled Hair. *Proceedings of SIGGRAPH*

[2] Shi, A., Wu, H., & Kim, T. (2025). Hyper-Dimensional Deformation Simulation. *Proceedings of SIGGRAPH*

[3] Wu, H.*, Shi, A*., Darke, A. M., & Kim, T. (2024). Curly-Cue: Geometric Methods for Highly Coiled Hair *Proceedings of SIGGRAPH Asia* (*Co-first authors)

[4] Shi, A.*, Wu, H.*, Parr, J., Darke, A. M., & Kim, T. (2023). Lifted Curls: A Model for Tightly Coiled Hair Simulation. *Proceedings of the ACM on Computer Graphics and Interactive Techniques* (*Co-first authors) (Best Paper Award)

[5] Shi, A., & Kim, T. (2023). A Unified Analysis of Penalty-Based Collision Energies. *Proceedings of the ACM on Computer Graphics and Interactive Techniques*

Teaching

Building Game Engines TA Fall 2025, Fall 2026
Computer Graphics TA Spring 2023, Fall 2023 Fall 2024, Spring 2026
Rated 5.0/5.0 for Spring 2026
Real-Time 3D Graphics TA Spring 2025
Advanced Topics in Computer Graphics TA Fall 2022

Employment History

Adobe | Research Intern Jun 2023 - Dec 2023
Center for Collaborative Arts and Media | Fellow Jan 2023 - Jun 2023
The Mystery League | Puzzle Developer Mar 2021 - Jun 2021
Hack Arts Lab | Lab Assistant Sept 2019 - Mar 2020

Service

Local 33 | Organizer & Trustee — Fall 2022 - Present
CounterGRAPH | Organizer — Fall 2026, 2027
Summer Geometry Initiative (MIT) | Project Mentor — Summer 2026
Countering Racial Bias BoF | Organizer — 2025, 2026
Game Developers Conference | Conference Associate — Spring 2024
UChicago Game Design | President — Fall 2019 - Spring 2021
Reviewer for: *Proceedings of SIGGRAPH, Proceedings of SIGGRAPH Asia, ACM Transactions on Graphics, Eurographics*

Industry Transfer

Pixar | Hair simulation in *Toy Story 5* — 2026
Netflix | Hairstyle generation algorithms for Netflix Animation — 2026

Awards and Press

Certificate of College Teaching Preparation — 2027 (Expected)
Poorvu Center for Teaching and Learning

Yale News — July 15, 2026
With help from the cosmetics field, animators figure out the math of highly coiled hair

Distinguished Teaching Award — 2025-2026
Yale Computer Science

NPR — March 16, 2025
An animation breakthrough makes it possible to more accurately illustrate Black hair

PopCultureBrain — March 11, 2025
Coming Soon: Real Black Hair in Animation
14 million views and 1.8 million likes on TikTok!

The Guardian — February 7, 2025
'This is Black Hair': Technological advances are making waves in animation

The Washington Post — November 30, 2024
Animations of coiled hair for Black film characters improve with new algorithms

Allure — November 14, 2024
We're Much Closer to A Disney Princess With Type 4 Hair

Yale News — October 30, 2024
Yale computer-scientists discover new visualization methods for Afro-textured hair on the screen

Yale News — August 4, 2023
Untangling the problem of animating tightly curled hair

Best Paper Award: *Lifted Curls* — 2023
Symposium on Computer Animation