

Zachary Ferguson

- CONTACT Courant Institute of Mathematical Sciences Geometric Computing Lab
New York University
60 Fifth Ave, Rm 520 email: zfergus@nyu.edu
New York, NY 10011 web: zferg.us
- RESEARCH Computer graphics, simulation, physically-based animation, collision detection and response,
INTERESTS digital fabrication, geometric modeling, geometry processing
- EDUCATION **New York University**, New York, NY Fall 2017–Present (Spring 2023)
Doctor of Philosophy in Computer Science
Advisor: Daniele Panozzo
- New York University**, New York, NY Fall 2017–Summer 2019
Master of Science equivalency in Computer Science
Qualifying exam topic: Physical Simulation for Fabrication
Advisor: Daniele Panozzo
- George Mason University**, Fairfax, VA Fall 2013–Spring 2017
Bachelor of Science in Computer Science; minor in Mathematics
Honors: *summa cum laude* (GPA: 3.96/4.00)
- PUBLICATIONS
- 1 LibHip: An open-access hip joint model repository suitable for finite element method simulation. Faezeh Moshfeghifar, Torkan Gholamalizadeh, **Zachary Ferguson**, Teseo Schneider, Michael Bachmann Nielsen, Daniele Panozzo, Sune Darkner, and Kenny Erleben. *Computer Methods and Programs in Biomedicine*, 2022
([paper](#), [data](#))
 - 2 Open-Full-Jaw: An open-access dataset and pipeline for finite element models of human jaw. Torkan Gholamalizadeh, Faezeh Moshfeghifar, **Zachary Ferguson**, Teseo Schneider, Daniele Panozzo, Sune Darkner, Masrour Makaremi, François Chan, Peter Lampel Søndergaard, and Kenny Erleben. *Computer Methods and Programs in Biomedicine*, 2022
([paper](#), [data](#))
 - 3 A Cross-Platform Benchmark for Interval Computation Libraries. Xuan Tang, **Zachary Ferguson**, Teseo Schneider, Denis Zorin, Shoab Kamil, and Daniele Panozzo. In *Proceedings of the 14th International Conference on Parallel Processing and Applied Mathematics*, 2022
 - 4 Fast and Exact Root Parity for Continuous Collision Detection. Bolun Wang, **Zachary Ferguson**, Xin Jiang, Marco Attene, Daniele Panozzo, and Teseo Schneider. *Computer Graphics Forum (Proceedings of Eurographics)*, 41(2), 2022
([project page](#), [paper](#), [code](#))
 - 5 A Large Scale Benchmark and an Inclusion-Based Algorithm for Continuous Collision Detection. Bolun Wang*, **Zachary Ferguson***, Teseo Schneider, Xin Jiang, Marco Attene, and Daniele Panozzo. *ACM Transactions on Graphics*, 40(5), 2021. Presented at

*Joint first authors

SIGGRAPH 2022
([project page](#), [paper](#), [code](#), [data](#))

- 6 Intersection-free Rigid Body Dynamics. **Zachary Ferguson**, Minchen Li, Teseo Schneider, Francisca Gil-Ureta, Timothy Langlois, Chenfanfu Jiang, Denis Zorin, Danny M. Kaufman, and Daniele Panozzo. *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, 40(4), 2021
([project page](#), [paper](#), [video](#), [code](#))
- 7 DHFSlicer: Double Height-Field Slicing for Milling Fixed-Height Materials. Jinfan Yang, Chrystiano Araújo, Nicholas Vining, **Zachary Ferguson**, Enrique Rosales, Daniele Panozzo, Sylvain Lefebvre, Paolo Cignoni, and Alla Sheffer. *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*, 39(6), 2020
([project page](#), [paper](#))
- 8 Incremental Potential Contact: Intersection- and Inversion-free Large Deformation Dynamics. Minchen Li, **Zachary Ferguson**, Teseo Schneider, Timothy Langlois, Denis Zorin, Daniele Panozzo, Chenfanfu Jiang, and Danny M. Kaufman. *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, 39(4), 2020
([project page](#), [paper](#), [video](#), [code](#))
- 9 Stitch Meshing. Kui Wu, Xifeng Gao, **Zachary Ferguson**, Daniele Panozzo, and Cem Yuksel. *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, 37(4), 2018
([project page](#), [paper](#), [video](#))
- 10 Seamless: Seam erasure and seam-aware decoupling of shape from mesh resolution. Songrun Liu*, **Zachary Ferguson***, Alec Jacobson, and Yotam Gingold. *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*, 36(6), 2017
([project page](#), [paper](#), [video](#), [code](#))

EMPLOYMENT **New York University**, Graduate Research Assistant Fall 2017–Present
Advisor: Daniele Panozzo, Geometric Computing Lab (GCL)
Research in digital fabrication, simulation, and geometry processing.

Adobe Research, Research Scientist Intern Summer 2022
Mentor: Danny Kaufman
Research in physical simulation and geometry processing.

Carbon, Computational Geometry Intern Summer 2021–Spring 2022
Supervisor: Weixiong Zheng and Hardik Kabaria
Research in simulation and physical validation of lattice structures with contact.

Adobe Research, Research Scientist Intern Summer 2018
Mentors: Qingnan Zhou and Danny Kaufman
Research in digital fabrication, simulation, and geometry processing.

George Mason University, Undergraduate Research Assistant Fall 2015–
Advisor: Yotam Gingold, Creativity and Graphics Lab (CraGL) Summer 2017
Research published as “Seamless: Seam erasure and seam-aware decoupling of shape from mesh resolution” in *ACM Transactions on Graphics*.

AWARDS **Adobe Research Fellowship** 2022

	Adobe Inc.	
	Dean's Dissertation Fellowship Graduate School of Arts and Science, New York University	2022
	Jacob T. Schwartz Ph.D. Fellowship Courant Institute of Mathematical Science, New York University	2021
	Henry M. MacCracken Fellowship Graduate School of Arts and Science, New York University	2017
	Distinguished Academic Achievement Award Computer Science Department, George Mason University	2017
	PEC Solutions Endowed Scholarship Volgenau School of Engineering, George Mason University	2016
	Dean's Scholarship Volgenau School of Engineering, George Mason University	2015
SELECTED TALKS	Towards Robust and Accurate Simulation of Contacts International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC)	August 2022
COURSES	SIGGRAPH Contact and Friction Simulation for Computer Graphics Sheldon Andrews, Kenny Erleben, and Zachary Ferguson	2022
TEACHING	New York University , Teaching Assistant Special Topics: Computer Graphics (CSCI-UA.0480)	Fall 2019
	iD Tech , Instructor Game Programming for Apple iOS and Android with Unity	Summer 2015
PROFESSIONAL ACTIVITIES	ACM SIGGRAPH Asia , Reviewer ACM SIGGRAPH North America , Reviewer Computers & Graphics , Reviewer Computer-Aided Design , Reviewer Computer Aided Geometric Design , Reviewer	2022 2020, 2022 2018, 2021 2021 2020
OPEN-SOURCE PROJECTS	IPC (C++): https://github.com/ipc-sim/IPC IPC Toolkit (C++ and Python): https://ipc-sim.github.io/ipc-toolkit PolyFEM (C++ and Python): https://polyfem.github.io/ Rigid IPC (C++): https://github.com/ipc-sim/rigid-ipc Seam Erasure (Python): https://github.com/zfergus/seam-erasure	
TECHNICAL SKILLS	Languages: C/C++, Python, JavaScript, Java, MATLAB, OCaml, Common Lisp Libraries: OpenGL (GLSL), PyTorch Game Development: Unity (C#), Phaser (JavaScript)	

Web Development: HTML, CSS, JavaScript
Applications: Blender, Fusion 360 (CNC Milling)