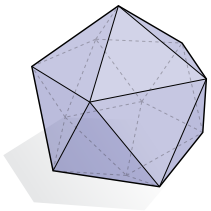

Keenan Crane
Curriculum Vitæ

http://www.cs.cmu.edu/~kmcrane
5000 Forbes Ave, Pittsburgh PA 15213
kmcrane@cs.cmu.edu
(412) 268-3454

Employment

Associate Professor with tenure (2024–)
Computer Science Department and Robotics Institute
Department of Electrical and Computer Engineering (courtesy) Carnegie Mellon University

Associate Professor without tenure (2021–2024)
Michael B. Donohue Career Development Professor
Computer Science Department and Robotics Institute
Department of Electrical and Computer Engineering (courtesy) Carnegie Mellon University

Assistant Professor (2015–2021)
Computer Science Department and Robotics Institute
Carnegie Mellon University

NSF Mathematical Sciences Postdoctoral Fellow (2013–2015)
Columbia University

Education

PhD, Computer Science
California Institute of Technology (2010–2013)

MS, Computer Science
California Institute of Technology (2007–2010)

BS, Computer Science
University of Illinois at Urbana-Champaign (2002–2006)

Publications

Books

1. Keenan Crane (ed.)
   An Excursion into Discrete Differential Geometry
   Proceedings of Symposia in Applied Mathematics (76) 2020

Journal Articles

2. Nicole Feng, Mark Gillespie, Keenan Crane
   Winding Numbers on Discrete Surfaces
   ACM Transactions on Graphics (2023)

3. Rohan Sawhney, Bailey Miller, Ioannis Gkioulekas, Keenan Crane
   Walk on Stars: A Grid-Free Monte Carlo Method for PDEs with Neumann Boundary Conditions
   ACM Transactions on Graphics (2023)

4. Derek Liu, Benjamin Chislett, Mark Gillespie, Alec Jacobson, Keenan Crane
   Surface Simplification with Intrinsic Error Metrics
   ACM Transactions on Graphics (2023)

5. Bailey Miller, Rohan Sawhney, Keenan Crane, Ioannis Gkioulekas
Boundary Value Caching for Walk on Spheres
ACM Transactions on Graphics (2023)

6. Rohan Sawhney, Dario Seyb, Wojciech Jarosz, Keenan Crane
Grid-Free Monte Carlo for PDEs with Spatially Varying Coefficients
ACM Transactions on Graphics (2022) [Best Paper, Honorable Mention]

7. Nicholas Sharp, Souhaib Attaiki, Keenan Crane, Maks Ovsjanikov
DiffusionNet: Discretization Agnostic Learning on Surfaces
ACM Transactions on Graphics (2022)

8. Mark Gillespie, Nicholas Sharp, Keenan Crane
Integer Coordinates for Intrinsic Geometry Processing
ACM Transactions on Graphics (2021)

9. Chris Yu, Caleb Brakensiek, Henrik Schumacher, Keenan Crane
Repulsive Surfaces
ACM Transactions on Graphics (2021)

10. Mark Gillespie, Boris Springborn, Keenan Crane
Discrete Conformal Equivalence of Polyhedral Surfaces
ACM Transactions on Graphics 40 (4) 2021

11. Chris Yu, Henrik Schumacher, Keenan Crane
Repulsive Curves
ACM Transactions on Graphics 40 (2) 2021

12. Nicholas Sharp, Keenan Crane
You Can Find Geodesic Paths in Triangle Meshes by Just Flipping Edges
ACM Transactions on Graphics 39 (6) 2020

13. Rohan Sawhney, Keenan Crane
Monte Carlo Geometry Processing: A Grid-Free Approach to PDE-Based Methods on Volumetric Domains
ACM Transactions on Graphics 39 (4) 2020

14. Nicholas Sharp, Keenan Crane
A Laplacian for Nonmanifold Triangle Meshes
SGP / Computer Graphics Forum 39 (5) 2020 [Best Paper Award]

15. Katherine Ye, Wode Ni, Max Krieger, Dor Ma'ayan, Jenna Wise, Joshua Sunshine, Jonathan Aldrich, Keenan Crane
Penrose: From Mathematical Notation to Beautiful Diagrams
ACM Transactions on Graphics 39 (4) 2020

16. Nicholas Sharp, Yousuf Soliman, Keenan Crane
Navigating Intrinsic Triangulations
ACM Transactions on Graphics 38 (4) 2019

17. Etienne Corman, Keenan Crane
Symmetric Moving Frames
ACM Transactions on Graphics 38 (4) 2019

18. Nicholas Sharp, Yousuf Soliman, Keenan Crane
The Vector Heat Method
ACM Transactions on Graphics 38 (3) 2019

19. Nicholas Sharp, Keenan Crane
Variational Surface Cutting
ACM Transactions on Graphics 37 (4) 2018

20. Yousuf Soliman, Dejan Slepčev, Keenan Crane
Optimal Cone Singularities for Conformal Flattening
ACM Transactions on Graphics 37 (4) 2018

21. Oded Stein, Eitan Grinspun, Keenan Crane
Developability of Triangle Meshes
ACM Transactions on Graphics 37 (4) 2018

22. Mina Konakovic, Julian Panetta, Keenan Crane, Mark Pauly
Rapid Deployment of Curved Surfaces via Programmable Auxetics
ACM Transactions on Graphics 37 (4) 2018

23. Alex Baden, Keenan Crane, Misha Kazhdan
Möbius Registration
SGP / Computer Graphics Forum 37 (5), 2018

24. Rohan Sawhney, Keenan Crane
Boundary First Flattening
ACM Transactions on Graphics 37 (1) 2017

25. Chris Yu, Keenan Crane, Stelian Coros
Computational Design of Telescoping Structures
ACM Transactions on Graphics 36 (4), 2017

26. Derek Liu, Alec Jacobson, Keenan Crane
A Dirac Operator for Extrinsic Shape Analysis
SGP / Computer Graphics Forum 36 (5), 2017

27. Mina Konakovic, Keenan Crane, Bailin Deng, Sofien Bouaziz, Daniel Piker, Mark Pauly
Beyond Developable: Computational Design and Fabrication with Auxetic Materials
ACM Transactions on Graphics 35 (4), 2016

28. Felix Knöppel, Keenan Crane, Ulrich Pinkall, Peter Schröder
Stripe Patterns on Surfaces
ACM Transactions on Graphics 34 (4), 2015

29. Keenan Crane, Clarisse Weischedel, Max Wardetzky
Geodesics in Heat: A New Approach to Computing Distance Based on Heat Flow
ACM Transactions on Graphics 32 (5), 2013

30. Keenan Crane, Ulrich Pinkall, Peter Schröder
Robust Fairing via Conformal Curvature Flow
ACM Transactions on Graphics 32 (4), 2013

31. Felix Knöppel, Keenan Crane, Ulrich Pinkall, Peter Schröder
Globally Optimal Direction Fields
ACM Transactions on Graphics 32 (4), 2013

32. Keenan Crane, Ulrich Pinkall, Peter Schröder
Spin Transformations of Discrete Surfaces
ACM Transactions on Graphics 30 (4), 2011

33. Keenan Crane, Mathieu Desbrun, Peter Schröder
Trivial Connections on Discrete Surfaces
SGP / Computer Graphics Forum 29 (5), 2010 [Best Paper Award]

34. Patrick Mullen, Keenan Crane, Dmitry Pavlov, Yiying Tong, Mathieu Desbrun
Energy-Preserving Integrators for Fluid Animation
ACM Transactions on Graphics 28 (3), 2009

35. Marin Kobilarov, Keenan Crane, Mathieu Desbrun
Lie Group Integrators for Animation and Control of Vehicles
ACM Transactions on Graphics 28 (2), 2009

36. Ryan White, Keenan Crane, David Forsyth
Capturing and Animating Occluded Cloth
ACM Transactions on Graphics 26 (3), 2007

37. Eliot Young, Richard Binzel, Keenan Crane
A Two-color Map of Pluto's Sub-Charon Hemisphere
The Astronomical Journal 121 (1), 2001

Other Refereed Publications

38. Nicholas Sharp, Mark Gillespie, Keenan Crane
Geometry Processing with Intrinsic Triangulations
ACM SIGGRAPH Course Notes, 2021

39. Keenan Crane
Conformal Geometry of Simplicial Surfaces
Proceedings of Symposia in Applied Mathematics (2020)

40. Wode Ni, Katherine Ye, Joshua Sunshine, Jonathan Aldrich, Keenan Crane
SUBSTANCE and STYLE: Domain-Specific Languages for Mathematical Diagrams
DSLDI (Domain-Specific Language Design and Implementation) 2017

41. Katherine Ye, Keenan Crane, Jonathan Aldrich, and Joshua Sunshine
Designing Extensible, Domain-Specific Languages for Mathematical Diagrams
ACM SIGPLAN POPL - Off the Beaten Track 2017

42. Keenan Crane, Fernando de Goes, Mathieu Desbrun, Peter Schröder
Digital Geometry Processing with Discrete Exterior Calculus
ACM SIGGRAPH Course Notes, 2013

43. Michael Glueck, Keenan Crane, Sean Anderson, Andres Rutnik, Azam Khan
Multiscale 3D Reference Visualization
Proceedings of the Symposium on Interactive 3D Graphics, 2009

44. Keenan Crane, Ignacio Llamas, Sarah Tariq
Real Time Simulation and Rendering of 3D Fluids
GPU Gems 3 (Addison-Wesley), 2007

45. Ryan White, Keenan Crane, David Forsyth
Data Driven Cloth Animation
ACM SIGGRAPH Technical Sketches, 2007

46. Nathan Carr, Jared Hoberock, Keenan Crane, John Hart
Rectangular Multi-Chart Geometry Images
Proceedings of the Symposium on Geometry Processing, 2006

47. Nathan Carr, Jared Hoberock, Keenan Crane, John Hart
Fast GPU Ray Tracing of Dynamic Meshes
Proceedings of Graphics Interface, 2006

Technical Reports and Manuscripts

48. Keenan Crane, Marco Livesu, Enrico Puppo, Yipeng Qin
A Survey of Algorithms for Geodesic Paths and Distances
arXiv:2007.10430, 2020

49. Justin Solomon, Keenan Crane, Adrian Butscher, Chris Wojtan
A General Framework for Bilateral and Mean Shift Filtering
arXiv:1405.4734, 2014

Invited Papers

50. Keenan Crane, Max Wardetzky *A Glimpse into Discrete Differential Geometry*
Notices of the AMS, November 2017

51. Keenan Crane, Clarisse Weischedel, Max Wardetzky
The Heat Method for Distance Computation
Communications of the ACM (CACM) Research Highlights, November 2017

52. Keenan Crane
Conformal Geometry Processing
Caltech PhD thesis, 2013

53. Keenan Crane
Discrete Connections for Geometry Processing
Caltech MS thesis, 2010

Professional Activities

Technical Papers co-Chair - Symposium on Geometry Processing (2021)
Steering Committee - Curves and Surfaces (2024–2026)
Associate Editor - ACM Transactions on Graphics (2017–2020)
Steering Committee - Summer Geometry Initiative (2021–2023)
Steering Committee - Illustrating Mathematics (2019–)
Inaugural Committee Member - ACM SIGGRAPH Doctoral Consortium (2018)
Technical Papers Committee - SIGGRAPH (2015, 2016, 2021, 2024), SIGGRAPH Asia (2014, 2019, 2020)
Committee Member - AMS Short Course Subcommittee (2019–2022)
Co-Organizer - ICERM Workshop on Illustrating Geometry & Topology (2019)
Organizer - AMS Short Course on Discrete Differential Geometry, Joint Mathematics Meeting (2018)
Program Committee - Symposium on Geometry Processing (SGP 2013, 2014, 2015, 2018, 2019, 2020)
Program Committee - Conference on Computer Vision & Pattern Recognition (CVPR 2013)
Program Committee - Tiny Transactions on Computer Science (TinyToCS 2013)
Program Committee - Midwest Conference on Computer Graphics (MIDGRAPH 2005)
Chair - ACM SIGGRAPH Student Chapter at UIUC (2005)
Reviewer: **SIGGRAPH** 2006–2021; **SIGGRAPH Asia** 2008, 2010, 2013–2021; **ACM Transactions on Graphics** 2007, 2008, 2012, 2014–2020; **Eurographics** 2006, 2007, 2011, 2013, 2016, 2017; **Pacific Graphics** 2013, 2014; **IEEE TVCG** 2009, 2011, 2012, 2014, 2015; **Computers & Graphics** 2011, 2012; **ECCV** 2012; **CVPR** 2013; **GMOD** 2013; **Graphics Interface** 2006; **MIDGRAPH** 2005; **SIAM SIIMS** 2011, 2012; **Computer Aided Design** 2013; **Computer Graphics Forum** 2013; **Origami6** 2015.
Panelist - NSF core programs

CSRankings.org: 7th most productive Computer Graphics researcher in US (of 153) during time at CMU (2015–2023)
YouTube (https://www.youtube.com/keenancrane) — 1.2 million views as of April 3, 2023.
Twitter (https://twitter.com/keenanisalive) — 23k followers as of April 3, 2023.

Press Coverage

The Aperiodical, *"—$e^{i\pi}$ to Watch: Keenan Crane"* (November 2023)
New York Times, *"Theyre Taking Jigsaws to Infinity and Beyond"* (December 2022)
Dartmouth University, *"Shining Light on Hard Math to Recreate Reality"* (August 2022)
WIRED, *"Computer Scientist Explains Fractals in 5 Levels of Difficulty"* (May 2022)
Hackaday, *"This Spherical Lamps Pieces Ship Flat, Thanks to Math"* (May 2022)
SCS News, *"Repulsive Energies Lead CMU Researchers To Rethink Computer Graphics"* (December 2021)
Tech XPlore, *"Analysis of Complex Geometric Models Made Simple"* (July 2020)
Popular Mechanics, *"Finally, Software That Turns Confusing Math Equations Into Simple Images"* (June 2020)
Notices of the AMS, *"Packard Fellowships Awarded"* (February 2019)
ACM News, *"2018 Packard Fellowships Include 2 Computer Scientists"* (October 2018)
ZDNet, *"Telescoping Robots Can Shrink to Travel"* (August 2017)
90.5 WESA, *"CMU Researchers Put A Twist On Telescoping Structures"* (August 2017)
ACM SIGGRAPH Press Release, *"Making Telescopes that Curve and Twist"* (July 2017)
WIRED, *"A Freaky Anti-Rubber Is Still Weirding Scientists Out"* (August 2016)
NSF Science Now, *"Computational Design Tool Transforms Flat Materials into 3-D Shapes"* (August 2016)
3DPrint.com, *"These 3D Printed Porcelain Coffee Mugs & Donuts are Clever Topology-Related Joke"* (August 2015)
Scientific American Blog, *"In Love with Geometry"* (September 2013)
National Public Radio, *"Digital Domain Grapples with Fur, Feathers"* (June 2012)
Engineering & Science Magazine, *"Conquering Shapes"* (Spring 2012)

Awards & Honors

Packard Fellowship (2018–2023)
Awarded to 18 faculty/year across all areas of science and engineering; $875,000 over 5 years.

NSF CAREER Award (2020–2025)
Awarded to ∼100 computer science faculty/year; $519,154 over 5 years.

Michael B. Donohue Career Development Professorship (2021–2024)
Awarded to one junior faculty member in the CMU School of Computer Science every 3 years.

NSF Mathematical Sciences Postdoctoral Fellowship (2013–2015; NSF Award #1304254)
Awarded to top 15% of applicants across all areas of pure & applied mathematics; $150,000 over 2 years.

Google PhD Fellowship (2010–2013)
Awarded to ∼15 students/year across all disciplines of computer science; 3-years tuition & stipend.

2021 Early Career Academic Achievement Alumni Award
Awarded annually by the UIUC Department of Computer Science.

2020 Eurographics Junior Fellow
About 2–4 new fellows elected annually across computer graphics.

2022 SIGGRAPH Best Paper Award, Honorable Mention

2020 Symposium on Geometry Processing Best Paper Award

2019 Symposium on Geometry Processing Software Award
One award per year; € 1000 prize.

2013 Heidelberg Laureate Forum

2012 Oberwolfach Graduate Student Fellow

2012 Everhart Distinguished Speaker

2010 Symposium on Geometry Processing Best Paper Award

2011 NSF Junior Oberwolfach Fellow

Industry Experience

Autodesk Research, Toronto, Canada	*Research Intern*	(Summer 2008)
NVIDIA Corporation, Santa Clara, CA	*Demo Team Intern*	(Summer 2006)
NVIDIA Corporation, Santa Clara, CA	*Demo Team Intern*	(Summer 2005)
NVIDIA Corporation, Santa Clara, CA	*Architecture Intern*	(Summer 2004)
Southwest Research Institute, Department of Space Studies	*Student Researcher*	(Spring 2000 - Spring 2002)

Invited Talks

February 27, 2024
Shape Spaces for Biomembranes?
Interpretable Quantitative Cell Representations Summit
Allen Institute for Cell Science

February 23, 2024
Monte Carlo Geometry Processing
University of Washington
Seattle, Washington

September 7, 2023
Walk on X: Simulating Nature without Simplifying the Geometry
Packard Fellows Meeting
Colorado Springs, CO

August 22, 2022
Monte Carlo Geometry Processing
Oberwolfach Mathematical Research Institute
Oberwolfach, Germany

June 16, 2022
Repulsive Shape Optimization
Mathematical Institute
University of Oxford

November 18, 2021
Repulsive Shape Optimization
Center on Frontiers of Computing Studies
Peking University

July 6–9, 2020
(Postponed due to COVID)
SIAM Conference on Imaging Science
Toronto, Canada

March, 2020
Symmetric Moving Frames
University of Göttingen
Göttingen, Germany

September 2, 2019
Intrinsic Triangulations **[Keynote]**
International Geometry Workshop
Strobl, Austria

October 17, 2018
Differential Geometry and Digital Fabrication
G. Milton Wing Lectures
University of Rochester

October 19, 2018
Discrete Conformal Geometry II: Beyond Uniformization
G. Milton Wing Lectures
University of Rochester

July 10, 2017
Extrinsic Conformal Geometry
FoCM'17 Computational Topology & Geometry Workshop
Barcelona, Spain

November 18, 2016
Differential Geometry and Developability **[Keynote]**
Symposium on Geometry & Computational Design
Vienna, Austria

June 17, 2016
Laplace-Beltrami: The Swiss Army Knife of Geometry Processing
EU Regional School
Aachen, Germany

July 6, 2023
Monte Carlo Geometry Processing **[Keynote]**
International Geometry Summit
Genoa, Italy

June 20, 2022
Intrinsic Geometry Processing **[Plenary]**
International Conference on Curves & Surfaces
Arcachon, France

April 27, 2022
Geometry Processing & Differential Geometry
Unity, Inc.
Conversations with Research Pioneers

May 7–9, 2021
Intrinsic Triangulations **[Keynote]**
Center of Mathematics Sciences and Applications
Harvard University

June 15–24, 2020
(Postponed due to COVID)
FoCM'20 Computational Topology & Geometry Workshop
Vancouver, Canada

September 5, 2019
Discrete Differential Geometry
Packard Fellows Meeting
Monterey, CA

April 1, 2019
Heat Methods in Geometry Processing
IPAM Workshop on Geometric Processing
Los Angeles, CA

October 18, 2018
Discrete Conformal Geometry I: Uniformization
G. Milton Wing Lectures
University of Rochester

September 21, 2017
Boundary First Flattening
International Geometry Workshop
Obergurgl, Austria

November 16, 2016
Boundary First Flattening
IST Austria
Klosterneuburg, Austria

July 1, 2016
Conformal Geometry and Auxetic Linkages
Brown University / ICERM
Providence, RI

January 28, 2016
Linear Conformal Parameterization with Boundary Control
Oberwolfach Mathematical Research Institute
Oberwolfach, Germany

October 14, 2015
Line Bundles in Geometry Processing
Oberwolfach Mathematical Research Institute
Oberwolfach, Germany

April 27, 2015
Illustrating Geometry
Princeton University
Princeton, NJ

March 10, 2015
Spin Transformations and Geometry Processing
Technische Universität Berlin
Berlin, Germany

April 8, 2014
Optimizing Algorithms at the Level of Geometry
Carnegie Mellon School of Computer Science
Pittsburgh, PA

March 20, 2014
Optimizing Algorithms at the Level of Geometry
University of Toronto, Department of Computer Science
Toronto, Canada

February 27, 2014
Optimizing Algorithms at the Level of Geometry
Georgia Tech College of Computing
Atlanta, GA

December 12, 2013
Fast Algorithms for Geometry Processing
Blue Sky Studios
Greenwich, CT

August 31, 2013
Globally Optimal Direction Fields
International Geometry Workshop
Strobl, Austria

August 31, 2012
Optimal Algorithms for Vector Field Design and Editing
Rhythm and Hues Studios
El Segundo, California

June 18, 2012
Manipulating Geometry via Extrinsic Curvature
DDG Workshop @ SoCG
Chapel Hill, North Carolina

May 9, 2012
Helping Machines (and People) Think About Shape
Caltech Everhart Lecture Series
Pasadena, California

March 27, 2012
Robust Fairing using Conformal Surface Flows
Hausdorff Research Institute for Mathematics
Bonn, Germany

July 10, 2015
Developable Surface Flow
International Geometry Workshop
Seggau, Austria

April 19, 2015
Line Bundles in Geometry Processing
Columbia University
New York, NY

June 27, 2014
Optimizing Algorithms at the Level of Geometry
Google
Mountainview, CA

April 1, 2014
Optimizing Algorithms at the Level of Geometry
Stanford University, Department of Computer Science
Stanford, CA

March 19, 2014
Optimizing Algorithms at the Level of Geometry
Autodesk Research
Toronto, Canada

February 24, 2014
Optimizing Algorithms at the Level of Geometry
UCSD Department of Computer Science and Engineering
San Diego, CA

September 3, 2013
Geodesics in Heat
Institute of Science and Technology Austria
Klosterneuburg, Austria

November 18, 2012
Manipulating Geometry via Extrinsic Curvature
Johns Hopkins University
Baltimore, Maryland

July 11, 2012
The Heat Method
Oberwolfach Mathematical Research Institute
Oberwolfach, Germany

May 19, 2012
Helping Machines (and People) Think About Shape
Caltech Alumni Association Seminar Day
Pasadena, California

April 19, 2012
Optimal Algorithms for Vector Field Design and Editing
Digital Domain
Venice, California

December 13, 2011
Helping Machines Think About Shape
Johns Hopkins Center for Imaging Science
Baltimore, Maryland

July 11, 2011
Spin Transformations of Discrete Surfaces
École Polytechnique Fédérale de Lausanne (EPFL)
Lausanne, Switzerland

June 21, 2011
Conformal Surface Flows
International Geometry Workshop
Obergurgl, Austria

May 24, 2011
Recent Developments in Discrete Differential Geometry
California Institute of Technology
Pasadena, CA

February 2, 2011
Spin Transformations of Discrete Surfaces
Oberwolfach Mathematical Research Institute
Oberwolfach, Germany

May 20, 2010
Trivial Connections on Discrete Surfaces
Barrett Memorial Lectures
Knoxville, TN

June 28, 2011
Spin Transformations of Discrete Surfaces
Institute of Science and Technology Austria
Klosterneuburg, Austria

June 17, 2011
Recent Developments in Discrete Differential Geometry
Institute of Science and Technology Austria
Klosterneuburg, Austria

April 13, 2011
Spin Transformations of Discrete Surfaces
Stanford University
Stanford, CA

September 30, 2010
Trivial Connections on Discrete Surfaces
Freie Universität Berlin
Berlin, Germany

July 7, 2009
Lie Group Integrators for Animation and Control of Vehicles
Technische Universität Berlin
Berlin, Germany

Teaching and Education

At CMU:

Term	Course	Number	FCE Overall Teaching	Dept. Avg.
Fall 2015	Computer Graphics Seminar	15-869J	**4.9**	4.3
Fall 2015	Computer Graphics	15-462/662	**4.8/4.9**	4.3
Spring 2016	Discrete Differential Geometry	15-869J	**4.8**	4.3
Fall 2016	Computer Graphics	15-462/662	**4.7/4.9**	4.3
Fall 2017	Discrete Differential Geometry	15-458/858	**4.1/4.7**	4.2
Fall 2017	Computer Graphics	15-462/662	**4.7/4.6**	4.2
Fall 2018	Computer Graphics	15-462/662	**4.9/4.8**	4.2
Spring 2019	Discrete Differential Geometry	15-458/858	**5.0/4.8**	4.2
Spring 2020	Computer Graphics	15-462/662	**4.5/4.7**	4.4
Spring 2020	Discrete Differential Geometry	15-458/858	**4.9/4.5**	4.4
Fall 2020	Computer Graphics	15-462/662	**4.7/5.0**	3.5
Spring 2021	Discrete Differential Geometry	15-458/858	**4.2/4.8**	4.3
Fall 2021	Computer Graphics	15-462/662	**4.1/4.4**	4.3
Spring 2022	Discrete Differential Geometry	15-458/858	**4.8/4.6**	4.3
Spring 2023	Discrete Differential Geometry	15-458/858	**4.2/4.9**	4.2
Fall 2023	Monte Carlo Methods	15-327/627/860, 21-387		

At previous institutions:
Teaching Assistant — Caltech CS 177 (Discrete Differential Geometry), **2011, 2012**
Teaching Assistant — Caltech CS 101.4 (Algorithms in Geometry and Topology), **2009**

External Teaching Activities:

August 9, 2021
Geometry Processing with Intrinsic Triangulations
ACM SIGGRAPH Courses
Virtual/Online

June 21, 2021
Geometry Processing with Intrinsic Triangulations
International Meshing Roundtable
Virtual/Online

July 7, 2018
Conformal Geometry Processing
Symposium on Geometry Processing Grad School
Paris, France

July 1, 2017
Conformal Geometry Processing
Symposium on Geometry Processing Grad School
London, UK

July 11, 2014
Geometry Processing with Laplace-Beltrami
Symposium on Geometry Processing Grad School
Cardiff, Wales

July 8, 2013
Geometry Processing with Discrete Exterior Calculus
Symposium on Geometry Processing Grad School
Genova, Italy

January 5–6, 2018
Discrete Conformal Geometry
Joint Mathematics Meeting
San Diego, CA

July 6, 2017
Conformal Geometry Processing
AICES EU Regional School
Aachen, Germany

July 22, 2013
Geometry Processing with Discrete Exterior Calculus
SIGGRAPH Courses
Anaheim, CA

July 14, 2012
Differential Geometry and Discrete Curvature Flows
Symposium on Geometry Processing Grad School
Tallinn, Estonia

Advising

Current

PhD: Rohan Sawhney *(CMU CSD 2016–)*, Mark Gillespie *(CMU CSD 2018–)*, Nicole Feng *(CMU CSD 2020–)*, Olga Gutan *(CMU CSD 2022–)*, Hossein Baktash *(CMU ECE 2022–)*, Zoë Marschner *(CMU CSD 2023–)*

Past

High School: Caleb Brakensiek (Independent Study 2020–2021), **Undergrad:** Pooja Mathur *(UIUC Intel/Lockheed Martin URSP, 2005–2006)*, Isaac Kim *(Caltech SURF, 2011)*, Joaquín Ruales *(Columbia REU, 2014)* → Microsoft Software Engineer, Rohan Sawhney *(Columbia independent study, 2014)* → CMU CS PhD, Henrique Maia *Columbia independent study, 2014* → Columbia University CS PhD, Kevin Li *(Columbia REU 2015)* → Stanford CS PhD, Lucas Schuermann *(Columbia REU 2015)*, Bryce Summers *(CMU Senior Thesis, 2015)* → NYU IDM MS, Kai Kang *(CMU independent study, 2015)*, Surbhi Inani *(CMU SURF, 2016)*, Chris Kaffine *(CMU independent study 2017)*, Wode Ni *(CMU REUSE 2017)* → *CS PhD at CMU*, Connor Lin *(CMU 15-300 research project)* → CS PhD at Stanford, Joel Loo *(CMU independent research 2018)*, Lily Shellhammer *(CMU REUSE 2018)*, Christina Vaz *(CMU independent study, Google Summer of Code 2018)* → Amazon, Yousuf Soliman *(CMU Independent Study 2016–2018)* → Applied Math PhD at Caltech, Joshua Brakensiek *(CMU independent study 2017–2018)* → CS PhD at Stanford, Yumeng (Rain) Du *(CMU BCSA)*, Joshua Kalapos *(CMU CS)*, Ruihao (Ray) Ye *CMU Physics*, Alex Havrilla *(CMU CS/Math)*, Helena Yang *(CMU CS)*, Sahra Yusuf *(Summer Geometry Institute 2021)*, Tal Rastopchin *(Summer Geometry Institute 2021)*, Joana Portmann *(Summer Geometry Institute 2021)*, Daniel Li *(CMU CS Independent Study)*, Hesper Yin *(CMU CS Independent Study)* → UCSD CS PhD, Maxwell Slater *(CMU CS independent study)* → Jane Street, Ethan Lu *(CMU Independent Study 2019–2022)* → PhD Stanford Mathematics, Thomas Carey (CMU Independent Study 2021), Denise Yang *(CMU ECE Independent Study 2022-2023)* → Pixar. **MS:** Derek Liu *(CMU MechE MS 2017)* → CS PhD at UToronto; Denise Yang *(CMU ECE)* → Pixar Animation Studios. **Postdoc:** Etienne Corman (2017–2018) → French National Centre for Scientific Research (CNRS). **PhD:** Rohan Sawhney (PhD CMU CSD 2022) → Senior Research Scientist at NVIDIA AI; Nicholas Sharp (PhD CMU CSD 2021) → Senior Research Scientist at NVIDIA AI, Chris Yu (PhD CMU CSD 2021) → Pixar Animation Studios; Kai Ye (CMU CSD 2022) → Research Scientist at Basis AI. **Thesis Committee:** Péter Borosán (PhD, Rutgers University CS, 2013); Mina Konakovic (PhD, EPFL 2019) → Tenure-Track Faculty at MIT EECS; Philipp Herholz (PhD, TU Berlin CS, 2019); Hana Kourimska (PhD, TU Berlin Mathematics, 2020), Shumian Xin (PhD, CMU Robotics, TBD), Vidya Narayanan (PhD, CMU Computer Science, 2022); Marcel Padilla (PhD, TU Berlin Mathematics, 2023).