

Mark Gillespie

Curriculum Vitae

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 MarkGillespie

Academic Appointments

École Polytechnique / INRIA, Palaiseau, France
Postdoctoral Researcher

Sept. 2024–present

Education

Carnegie Mellon University,
PhD in Computer Science | Advisor: Keenan Crane

2018–2024

California Institute of Technology,
B.S. in Computer Science and B.S. in Mathematics

2014–2018

Journal Articles

Theo Braune*, Mark Gillespie*, Yiyong Tong, and Mathieu Desbrun. 2025

Discrete Torsion of Connection Forms on Simplicial Meshes

ACM Transactions on Graphics (SIGGRAPH), 44, 4. 2025. DOI: 10.1145/3731197

Mark Gillespie, Denise Yang, Mario Botsch, and Keenan Crane. 2024

Ray Tracing Harmonic Functions [Best Paper, Honorable Mention]

ACM Transactions on Graphics (SIGGRAPH), 43, 4 (99). 2024. DOI: 10.1145/3658201

Yuichi Hirose, Mark Gillespie, Angelica M. Bonilla Fominaya, and James McCann. 2024a

Solid Knitting [Best Paper, Honorable Mention]

ACM Transactions on Graphics (SIGGRAPH), 43, 4 (88). 2024. DOI: 10.1145/3658123

Nicole Feng, Mark Gillespie, and Keenan Crane. 2023

Winding Numbers on Discrete Surfaces

ACM Transactions on Graphics (SIGGRAPH), 42, 4 (36). 2023. DOI: 10.1145/3592401

Hsueh-Ti Derek Liu, Mark Gillespie, Benjamin Chislett, Nicholas Sharp, Alec Jacobson, and Keenan Crane. 2023

Surface Simplification Using Intrinsic Error Metrics

ACM Transactions on Graphics (SIGGRAPH), 42, 4 (118). 2023. DOI: 10.1145/3592403

Mark Gillespie, Nicholas Sharp, and Keenan Crane. 2021

Integer Coordinates for Intrinsic Geometry Processing

ACM Transactions on Graphics (SIGGRAPH ASIA), 40, 6 (252). 2021. DOI: 10.1145/3478513.3480522

Mark Gillespie, Boris Springborn, and Keenan Crane. 2021

Discrete Conformal Equivalence of Polyhedral Surfaces

ACM Transactions on Graphics (SIGGRAPH), 40, 4 (103). 2021. DOI: 10.1145/3450626.3459763

Other Refereed Publications

Mark Gillespie. 2024

Evolving Intrinsic Triangulations

PhD Thesis, Carnegie Mellon University. 2024. DOI: 10.1184/R1/25898782.v1

Yuichi Hirose, Mark Gillespie, Angelica M. Bonilla Fominaya, and James McCann. 2024b

Solid Knitting (Abstract)

SCF Adjunct '24 (15). 2024. DOI: 10.1145/3665662.3673257

Nicholas Sharp, **Mark Gillespie**, and Keenan Crane. 2021
Geometry Processing with Intrinsic Triangulations
 SIGGRAPH '21 Courses. 2021. DOI: 10.1145/3450508.3464592

Awards & Honors

Two SIGGRAPH Best Paper Award Honorable Mentions	2024
Awarded to 12 papers out of about 840 submissions; ~top 1.5% of papers	
NSF Graduate Research Fellowship	2019-2022
Awarded to top 15% of applicants across all areas of science; \$147,000 over 3 years	
Hertz Fellowship Finalist	2017
Awarded to top 5% of applicants of applicants across applied science, math, and engineering.	
Arthur R Adams SURF Fellow	2016-2017
SIGGRAPH ACM Turing Award Celebration Grant	2017
Awarded to 10 students in computer graphics from across the country.	

Other Research Experience

Technische Universität Berlin , Department of Mathematics	July 2023
Visiting Researcher <i>Host: Boris Springborn</i>	
University of California, San Diego , Department of Computer Science and Engineering	Summer 2022
Visiting Graduate <i>Host: Albert Chern</i>	
California Institute of Technology , Department of Computing and Mathematical Sciences	Summer 2017
Arthur R. Adams Undergraduate Researcher <i>Mentor: Peter Schröder</i>	
California Institute of Technology , Department of Computing and Mathematical Sciences	Summer 2016
Arthur R. Adams Undergraduate Researcher <i>Mentor: Mathieu Desbrun</i>	
California Institute of Technology , Department of Computing and Mathematical Sciences	2016–2017
Undergraduate Researcher <i>Mentor: Alan Barr</i>	

Selected Talks

Geometry Processing with Intrinsic Triangulations , GeomeriX Seminar	May 2025
Geometry Processing with Intrinsic Triangulations , 49th CGAL Developer Meeting	Apr. 2025
Ray Tracing Harmonic Functions , 49th CGAL Developer Meeting	Apr. 2025
New Foundations for Robust Geometry Processing , University of Utah	Feb. 2025
Ray Tracing Harmonic Functions , Oberwolfach Workshop on Surface Processing	Feb. 2025
Solid Knitting & Harmonic Hitting , IST Austria	Nov. 2024
Ray Tracing Harmonic Functions , ACM SIGGRAPH 2024	Aug. 2024
Intrinsic Triangulations in Geometry Processing , IST Austria	Sept. 2023
Intrinsic Triangulations in Geometry Processing , Geometry Workshop in Obergurgl	Aug. 2023
Intrinsic Triangulations in Geometry Processing , TU Berlin SFB TRR 109 Colloquium	Jul. 2023
Discrete Conformal Equivalence of Polyhedral Surfaces , UCSD Pixel Cafe	Apr. 2022
Discrete Conformal Equivalence of Polyhedral Surfaces , Toronto Geometry Colloquium	Mar. 2022
Integer Coordinates for Intrinsic Geometry Processing , ACM SIGGRAPH Asia 2021	Nov. 2021
Discrete Conformal Equivalence of Polyhedral Surfaces , ACM SIGGRAPH 2021	Aug. 2021

Geometry Processing with Intrinsic Triangulations , ACM SIGGRAPH 2021 Courses	<i>Aug. 2021</i>
Geometry Processing with Intrinsic Triangulations , SIAM IMR 2021 Courses	<i>June 2021</i>

Service

Program Committee

Symposium on Geometry Processing (2025)

Reviewing

SIGGRAPH (2019, 2022–2025), SIGGRAPH Asia (2022–2024), ACM Transactions on Graphics (2024–2025), Symposium on Geometry Processing (2025), Graphics Replicability Stamp Initiative (2025), Eurographics (2024), Computer Graphics Forum (2024), Journal of Computational and Applied Mathematics (2024–2025), Computer-Aided Design (2023), Transactions on Visualization and Computer Graphics (2023–2025), Computers & Graphics (2021)

Departmental

Organizer, Graphics Reading Group (2022–2023); Organizer, Graphics Seminar (2020–2021); Panel Speaker (CSD Visit Day 2020, 2023, CSD Introductory Course 2022); Organizer, PhD mutual mentorship pod (2022–2024)

Mentorship

Summer Geometry Initiative volunteer (2024), Advising Master’s student (2022–2023), CMU Summer Undergraduate Research Fellowship (2020)

Teaching Experience

CS 15-466/666: Computer Game Programming , Carnegie Mellon University	<i>Fall 2022</i>
Teaching Assistant	
CS 15-458/858: Discrete Differential Geometry , Carnegie Mellon University	<i>Spring 2019</i>
Teaching Assistant	
CS 171: Introduction to Computer Graphics , California Institute of Technology	<i>Fall 2017, 2018</i>
Teaching Assistant	
CS 38: Introduction to Algorithms , California Institute of Technology	<i>Spring 2016, 2017</i>
Teaching Assistant	

Press Coverage

Knitting Industry Creative , “Solid Knitting – A New Fabrication Technique”	<i>Aug. 2024</i>
Textile Technology Source , “Solid-Knitting Machine Builds Reconfigurable Objects”	<i>Aug. 2024</i>
Design Boom , “Carnegie Mellon University’s Researchers Develop ‘Solid Knitting’”	<i>Aug. 2024</i>
Material District , “Solid Knitting: 3D Printing with Yarn”	<i>Aug. 2024</i>
Cosmos Magazine , “3D Knitting Could Make Solid But Soft Furniture”	<i>Jul. 2024</i>
Interesting Engineering , “Beware IKEA: Solid Knitted 3-Dimensional Furniture Could Be a Reality”	<i>Jul. 2024</i>
New Atlas , “Innovative ‘Solid Knitting’ Machine Builds 100% Reconfigurable Objects”	<i>Jul. 2024</i>
ZME Science , “Solid Knitting: A Different Spin on 3D Printing That Can Make Furniture Out of Yarn”	<i>Jul. 2024</i>
ACM SIGGRAPH Blog , “Beyond the Threads”	<i>Jul. 2024</i>
CMU News , “Robotics Institute Introduces Solid Knitting as New Fabrication Technique”	<i>Jul. 2024</i>