

# Mark Gillespie

## Curriculum Vitae

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 MarkGillespie

### Academic Appointments

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École Polytechnique, Palaiseau, France  
Postdoctoral Researcher

Sept. 2024–present

### Education

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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

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

*Ray Tracing Harmonic Functions*

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

[[Best Paper, Honorable Mention](#)]

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

*Solid Knitting*

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

[[Best Paper, Honorable Mention](#)]

Nicole Feng, Mark Gillespie, and Keenan Crane

*Winding Numbers on Discrete Surfaces*

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

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

*Surface Simplification Using Intrinsic Error Metrics*

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

Mark Gillespie, Nicholas Sharp, and Keenan Crane

*Integer Coordinates for Intrinsic Geometry Processing*

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

Mark Gillespie, Boris Springborn, and Keenan Crane

*Discrete Conformal Equivalence of Polyhedral Surfaces*

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

### Other Publications

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Mark Gillespie

*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

*Solid Knitting (Abstract)*

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

Nicholas Sharp, Mark Gillespie, and Keenan Crane

*Geometry Processing with Intrinsic Triangulations*

SIGGRAPH '21 Courses. 2021. DOI: 10.1145/3450508.3464592

## Awards & Honors

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

## Other Research Experience

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

## Selected Talks

<b>Solid Knitting &amp; Harmonic Hitting</b> , IST Austria	Nov. 2024
<b>Ray Tracing Harmonic Functions</b> , ACM SIGGRAPH 2024	Aug. 2024
<b>Intrinsic Triangulations in Geometry Processing</b> , IST Austria	Sept. 2023
<b>Intrinsic Triangulations in Geometry Processing</b> , Geometry Workshop in Obergurgl	Aug. 2023
<b>Intrinsic Triangulations in Geometry Processing</b> , TU Berlin SFB TRR 109 Colloquium	Jul. 2023
<b>Discrete Conformal Equivalence of Polyhedral Surfaces</b> , UCSD Pixel Cafe	Apr. 2022
<b>Discrete Conformal Equivalence of Polyhedral Surfaces</b> , Toronto Geometry Colloquium	Mar. 2022
<b>Integer Coordinates for Intrinsic Geometry Processing</b> , ACM SIGGRAPH Asia 2021	Nov. 2021
<b>Discrete Conformal Equivalence of Polyhedral Surfaces</b> , ACM SIGGRAPH 2021	Aug. 2021
<b>Geometry Processing with Intrinsic Triangulations</b> , ACM SIGGRAPH 2021 Courses	Aug. 2021
<b>Geometry Processing with Intrinsic Triangulations</b> , SIAM IMR 2021 Courses	June 2021

## Service

<b>Program Committee</b>
Symposium on Geometry Processing (2025)

## Reviewing

SIGGRAPH (2019, 2022–2024), SIGGRAPH Asia (2022–2024), ACM Transactions on Graphics (2024, 2025), Eurographics (2024), Computer Graphics Forum (2024), Journal of Computational and Applied Mathematics (2024), Computer-Aided Design (2023), Transactions on Visualization and Computer Graphics (2023–2024), 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

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

## Press Coverage

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<b>Knitting Industry Creative</b> , “Solid Knitting – a new fabrication technique”	<i>August 2024</i>
<b>Textile Technology Source</b> , “Solid-knitting machine builds reconfigurable objects”	<i>August 2024</i>
<b>Design Boom</b> , “Carnegie Mellon University’s researchers develop ‘solid knitting’”	<i>August 2024</i>
<b>Material District</b> , “Solid knitting: 3D printing with yarn”	<i>August 2024</i>
<b>Cosmos Magazine</b> , “3D knitting could make solid but soft furniture”	<i>July 2024</i>
<b>Interesting Engineering</b> , “Beware IKEA: Solid knitted three-dimensional furniture could be a reality”	<i>July 2024</i>
<b>New Atlas</b> , “Innovative ‘solid knitting’ machine builds 100% reconfigurable objects”	<i>July 2024</i>
<b>ZME Science</b> , “Solid knitting: a different spin on 3D printing that can make furniture out of yarn”	<i>July 2024</i>
<b>ACM SIGGRAPH Blog</b> , “Beyond the Threads”	<i>July 2024</i>
<b>CMU News</b> , “Robotics Institute Introduces Solid Knitting as New Fabrication Technique”	<i>July 2024</i>