

# Mark Gillespie

## Curriculum Vitae

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 MarkGillespie

### Academic Appointments

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**École Polytechnique / INRIA**, 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* [Best Paper, Honorable Mention]

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

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

*Solid Knitting* [Best Paper, Honorable Mention]

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

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 Refereed 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

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<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

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<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

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<b>Ray Tracing Harmonic Functions</b> , Oberwolfach Workshop on Surface Processing	Feb. 2025
<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

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<b>Program Committee</b>
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

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