

Mark Gillespie

Curriculum Vitae

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 MarkGillespie

Academic Appointments

École Polytechnique,
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

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

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

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	
Arthur R Adams SURF Fellow	2016-2017
SIGGRAPH ACM Turing Award Celebration Grant	2017

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

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	Aug. 2021
Geometry Processing with Intrinsic Triangulations , SIAM IMR 2021 Courses	June 2021

Service

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)

Reviewing

SIGGRAPH (2019, 2022-2024), SIGGRAPH Asia (2022-2024), ACM Transactions on Graphics (2024), 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)

Mentorship

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

Press Coverage

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