

HSUEH-TI DEREK LIU

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Curriculum Vitæ

RESEARCH/ACADEMIC POSITIONS

<i>Senior Research Scientist</i> Roblox Inc., Vancouver, Canada	2024 - Present
<i>Adjunct Professor</i> The University of British Columbia, Vancouver, Canada	2023 - Present
<i>Research Scientist</i> Roblox Inc., Vancouver, Canada	2022 - 2024

EDUCATION

University of Toronto <i>PhD, Computer Science</i> Advisor: Alec Jacobson	2017 - 2022
Carnegie Mellon University <i>MS, Mechanical Engineering</i> Advisors: Levent Burak Kara, Keenan Crane	2015 - 2017
National Taiwan University <i>BS, Engineering Science and Ocean Engineering</i>	2010 - 2014

PUBLICATIONS

1. Trust-Region Eigenvalue Filtering for Projected Newton 2024
Honglin Chen, **Hsueh-Ti Derek Liu**, Alec Jacobson, David I.W. Levin, Changxi Zheng
ACM SIGGRAPH Asia
2. Actuators À La Mode: Modal Actuations for Soft Body Locomotion 2024
Otman Benchekroun, Kaixiang Xie, **Hsueh-Ti Derek Liu**, Eitan Grinspun, Sheldon Andrews, Victor Zordan
ACM SIGGRAPH Asia
3. An Intrinsic Vector Heat Network 2024
Alexander Gao, Maurice Chu, Mubbasir Kapadia, Ming Lin, **Hsueh-Ti Derek Liu**
ICML
4. Stabler Neo-Hookean Simulation: Absolute Eigenvalue Filtering for Projected Newton 2024
Honglin Chen, **Hsueh-Ti Derek Liu**, David I.W. Levin, Changxi Zheng, Alec Jacobson
ACM SIGGRAPH
5. A Unified Differentiable Boolean Operator With Fuzzy Logic 2024
Hsueh-Ti Derek Liu, Maneesh Agrawala, Cem Yuksel, Tim Omernick, Vinith Misra, Stefano Corazza,

Morgan McGuire, Victor Zordan
ACM SIGGRAPH

6. Constructive Solid Geometry on Neural Signed Distance Fields 2023
Zoë Marschner, Silvia Sellán, **Hsueh-Ti Derek Liu**, Alec Jacobson
ACM SIGGRAPH Asia
7. Differentiable Heightfield Path Tracing with Accelerated Discontinuities 2023
Xiaochun Tong, **Hsueh-Ti Derek Liu**, Yotam Gingold, Alec Jacobson
ACM SIGGRAPH
8. Surface Simplification using Intrinsic Error Metrics 2023
Hsueh-Ti Derek Liu, Mark Gillespie, Benjamin Chislett, Nicholas Sharp, Alec Jacobson, Keenan Crane
ACM SIGGRAPH
9. Learning Smooth Neural Functions via Lipschitz Regularization 2022
Hsueh-Ti Derek Liu, Francis Williams, Alec Jacobson, Sanja Fidler, Or Litany
ACM SIGGRAPH
10. Kubric: A scalable dataset generator 2022
Klaus Greff, Francois Belletti, Lucas Beyer, Carl Doersch, Yilun Du, Daniel Duckworth, David J. Fleet, Dan Gnanapragasam, Florian Golemo, Charles Herrmann, Thomas Kipf, Abhijit Kundu, Dmitry Lagnun, Issam Laradji, **Hsueh-Ti Derek Liu**, Henning Meyer, Yishu Miao, Derek Nowrouzezahrai, Cengiz Oztireli, Etienne Pot, Noha Radwan, Daniel Rebain, Sara Sabour, Mehdi S. M. Sajjadi, Matan Sela, Vincent Sitzmann, Austin Stone, Deqing Sun, Suhani Vora, Ziyu Wang, Tianhao Wu, Kwang Moo Yi, Fangcheng Zhong, Andrea Tagliasacchi
CVPR
11. Surface Multigrid via Intrinsic Prolongation 2021
Hsueh-Ti Derek Liu, Jiayi Eris Zhang, Mirela Ben-Chen, Alec Jacobson
ACM SIGGRAPH
12. Normal-Driven Spherical Shape Analogies 2021
Hsueh-Ti Derek Liu, Alec Jacobson
Eurographics Symposium on Geometry Processing (SGP)
13. Chordal Decomposition for Spectral Coarsening 2020
Honglin Chen, **Hsueh-Ti Derek Liu**, Alec Jacobson, David I.W. Levin
ACM SIGGRAPH Asia
14. Neural Subdivision 2020
Hsueh-Ti Derek Liu, Vladimir G. Kim, Siddhartha Chaudhuri, Noam Aigerman, Alec Jacobson
ACM SIGGRAPH
15. Spectral Mesh Simplification 2020
Thibault Lescoat, **Hsueh-Ti Derek Liu**, Jean-Marc Thiery, Alec Jacobson, Tamy Boubekeur, Maks Ovsjanikov
Eurographics
16. Cubic Stylization 2019
Hsueh-Ti Derek Liu, Alec Jacobson
ACM SIGGRAPH Asia

17. Spectral Coarsening of Geometric Operators 2019
Hsueh-Ti Derek Liu, Alec Jacobson, Maks Ovsjanikov
ACM SIGGRAPH
18. Beyond Pixel Norm-Balls: Parametric Adversaries using an Analytically Differentiable Renderer 2019
Hsueh-Ti Derek Liu, Michael Tao, Chun-Liang Li, Derek Nowrouzezahrai, Alec Jacobson
ICLR
19. Paparazzi: Surface Editing by way of Multi-View Image Processing 2018
Hsueh-Ti Derek Liu, Michael Tao, Alec Jacobson
ACM SIGGRAPH Asia
20. A Dirac Operator for Extrinsic Shape Analysis 2017
Hsueh-Ti Derek Liu, Alec Jacobson, Keenan Crane
Eurographics Symposium on Geometry Processing (SGP)

AWARDS

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| Eurographics PhD Thesis Award | 2022 |
| The Alain Fournier Dissertation Award | 2022 |
| Robert E. Lansdale / Okino Computer Graphics Graduate Fellowship | 2020, 2021 |
| Adobe Research Fellowship | 2020 |
| Mary H. Beatty Fellowship | 2019 |
| Mitacs Globalink Research Award | 2018 |

CONFERENCE TALKS

1. ACM SIGGRAPH, Los Angeles, United States August 2023
Surface Simplification using Intrinsic Error Metrics
2. Graphics Interface, Victoria, Canada June 2023
Algorithms for Data-Driven Geometric Stylization & Acceleration
3. ACM SIGGRAPH, Vancouver, Canada August 2022
Learning Smooth Neural Functions via Lipschitz Regularization
4. ACM SIGGRAPH (Labs Demo), Vancouver, Canada August 2022
Learning Smooth Neural Functions via Lipschitz Regularization
5. ACM SIGGRAPH, Virtual August 2021
Surface Multigrid via Intrinsic Prolongation
6. Symposium on Geometry Processing, Virtual July 2021
Normal-Driven Spherical Shape Analogies
7. EUROGRAPHICS, Virtual May 2021
3D Modeling for Everyone
8. ACM SIGGRAPH, Virtual August 2020
Neural Subdivision

9. ACM SIGGRAPH Asia, Brisbane, Australia November 2019
Cubic Stylization
10. ACM SIGGRAPH, Los Angeles, United States August 2019
Spectral Coarsening of Geometric Operators
11. Graphics Interface, Kingston, Canada May 2019
Spectral Coarsening of Geometric Operators
12. International Conference on Learning Representation, New Orleans, United States May 2019
Beyond Pixel Norm-Balls: Parametric Adversaries using an Analytically Differentiable Renderer
13. ACM SIGGRAPH Asia, Tokyo, Japan December 2018
Paparazzi: Surface Editing by way of Multi-View Image Processing
14. ACM SIGGRAPH Asia (Doctoral Consortium), Tokyo, Japan December 2018
Operator-Preserving Algebraic Coarsening
15. Symposium on Geometry Processing, London, United Kingdom July 2017
A Dirac Operator for Extrinsic Shape Analysis

RESEARCH EXPERIENCES

1. *Consultant* December 2021 - August 2022
Urus Entertainment, Burbank, United States
2. *Research Intern* July 2021 - September 2021
NVIDIA AI, Toronto, Canada
Mentor: Sanja Fidler
3. *Research Intern* February 2021 - April 2021
NVIDIA AI, Toronto, Canada
Mentor: Sanja Fidler
4. *Research Intern* June 2019 - August 2019
Adobe Research, Seattle, United States
Mentors: Noam Aigerman, Siddhartha Chaudhuri, Vova Kim
5. *Visiting Researcher* June 2018 - January 2019
École Polytechnique, Palaiseau, France
Mentor: Maks Ovsjanikov

INVITED TALKS

1. Simon Fraser University November 2024
Differentiable Constructive Solid Geometry and Fuzzy Logic
2. University of British Columbia October 2023
Level of Detail for Geometry Computation
3. International Conference on Machine Learning July 2023
Geometric Learning on Discrete Surface Meshes

4. Brown University
Generative Models for Stylized Geometry November 2022
5. Simon Fraser University
Generative Models for Stylized Geometry November 2022
6. Adobe Research
Learning Smooth Neural Functions via Lipschitz Regularization October 2022
7. Technion - Israel Institute of Technology
3D Content Creation Made Fast & Easy July 2022
8. Talking Papers Podcast
Learning Smooth Neural Functions via Lipschitz Regularization May 2022
9. Roblox
3D Content Creation Made Fast & Easy April 2022
10. McGill
3D Content Creation Made Fast & Easy March 2022
11. Amazon
3D Content Creation Made Fast & Easy March 2022
12. Toronto Geometry Colloquium
3D Content Creation Made Fast & Easy March 2022
13. Université de Montréal
3D Content Creation Made Fast & Easy February 2022
14. Massachusetts Institute of Technology
Towards Scalable Geometry Processing May 2021
15. Autodesk AI
Generative Models for Stylized Geometry March 2021
16. NVIDIA AI, Toronto
3D Modeling for Everyone October 2020
17. GAMES, China
3D Modeling for Everyone September 2020
18. TOMOGRAPH, Waterloo, ON
Neural Subdivision December 2019
19. Autodesk Research, Toronto, ON
Cubic Stylization November 2019
20. Adobe Research, Seattle, WA
Spectral Coarsening of Geometric Operator August 2019
21. University of Washington, Seattle, WA
Spectral Coarsening of Geometric Operators July 2019

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| 22. Fields Institute, Toronto, ON | May 2019 |
| <i>Paparazzi: Surface Editing by way of Multi-View Image Processing</i> | |
| 23. Vector Institute, Toronto, ON | March 2019 |
| <i>Beyond Pixel Norm-Balls: Parametric Adversaries using an Analytically Differentiable Renderer</i> | |
| 24. École Polytechnique, Palaiseau, France | October 2018 |
| <i>Paparazzi: Surface Editing by way of Multi-View Image Processing</i> | |
| 25. Google | August 2018 |
| <i>A Differentiable Renderer for Image-Driven Shape Optimization</i> | |
| 26. École Polytechnique, Palaiseau, France | July 2018 |
| <i>A Differentiable Renderer for Image-Driven Shape Optimization</i> | |
| 27. University of Toronto, Toronto, ON | April 2017 |
| <i>From Intrinsic to Extrinsic Shape Analysis</i> | |

TEACHING

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| 1. University of British Columbia: CPSC 524 Computer Graphics: Modelling | 2024 |
| <i>Guest Lecture: Convolution on Discrete Surfaces</i> | |
| 2. University of British Columbia: CPSC 314 Computer Graphics | 2023 |
| <i>Guest Lecture: Introduction to Geometric Modeling</i> | |
| 3. Summer Geometry Institute | July 2022 |
| <i>Shape Deformation</i> | |
| 4. SIGGRAPH | August 2021 |
| <i>An Introduction to Deep Learning on Meshes</i> | |
| 5. Symposium on Geometry Processing | July 2021 |
| <i>An Introduction to Geometry Processing Programming in MATLAB with gptoolbox</i> | |
| 6. Summer Geometry Institute | July 2021 |
| <i>Shape Deformation</i> | |
| 7. University of Toronto: CSC2520 Geometry Processing | 2021 |
| <i>Guest Lecture: Convolution on Discrete Surfaces</i> | |
| 8. University of Toronto: CSC2521 Seminar in Geometry and Animation | 2022 |
| <i>Guest Lecture: Convolution on Discrete Surfaces</i> | |

PROFESSIONAL ACTIVITIES

Toronto Geometry Colloquium <https://toronto-geometry-colloquium.github.io>
 Co-organizing a weekly webseries to promote young researchers and researchers from underrepresented communities.
Program Committees

ACM SIGGRAPH Asia, Eurographics, Pacific Graphics, Shape Modelling International, Graphics Interface

Reviewer

ACM SIGGRAPH, ACM SIGGRAPH Asia, ACM Symposium on User Interface Software and Technology, ACM Transactions on Graphics, Computer-Aided Design, Computer Animation and Virtual Worlds, Computer Graphics and Applications, Computer Graphics Forum, CVPR, Eurographics, Graphics Interface, IEEE Transactions on Visualization and Computer Graphics, Pacific Graphics, Shape Modelling International, International Conference on 3D Vision