# David B. Lindell

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## Current Appointments

**Assistant Professor**
*Dept. of Computer Science, University of Toronto*                    *2022–present*

**Faculty Affiliate**
*Vector Institute*                    *2022–present*

## Education

**Stanford University**                    **Stanford, CA**
*Ph.D. Electrical Engineering*                    *2016–2021*
Committee: Gordon Wetzstein, Bernd Girod, Mark Horowitz, Vivek Goyal, James Harris

**Brigham Young University**                    **Provo, UT**
*M.Sc. Electrical Engineering*                    *2015–2016*
Advisor: David G. Long

**Brigham Young University**                    **Provo, UT**
*B.Sc. Electrical Engineering*                    *2009–2015*
Advisors: David G. Long, Aaron Hawkins

## Awards

**2021**: ACM SIGGRAPH Outstanding Doctoral Dissertation Honorable Mention

**2020**: ACM SIGGRAPH Thesis Fast Forward Honorable Mention

**2020**: CVPR Outstanding Reviewer

**2016–2020**: Stanford Graduate Research Fellowship

**2015**: BYU Office of Research & Creative Activities Grant

**2014**: Tau Beta Pi Scholarship

**2012–2015**: BYU Heritage Scholarship

## Previous Professional Experience

**Stanford University**                    **Stanford, CA**
*Postdoctoral Scholar*                    *2021–2022*
Advisor: Gordon Wetzstein

**Intelligent Systems Lab, Intel Corporation**                    **Santa Clara, CA**
*Intern*                    *2018*
Advisor: Vladlen Koltun

**Rincon Research Corporation**                    **Tucson, AZ**
*Intern*                    *2016*

## Conference Service

**Technical Papers Committee**: SIGGRAPH Asia 2023

**Area Chair**: Neural Information Processing Systems (Neurips) 2023

**Area Chair**: IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2023

**Finance Co-Chair**: Int. Conference on Computational Photography (ICCP) 2022

**Program Chair**: CVPR Workshop on Computational Cameras and Displays (CCD) 2020–2021

**Program Committee**: Int. Conference on Computational Photography (ICCP) 2019–2023

## Referee Service

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|---|---|
| CVPR | 2020– |
| ECCV | 2020– |
| ICCV | 2021– |
| ICCP | 2019– |
| ICLR | 2021– |
| NeurIPS | 2021– |
| SIGGRAPH | 2020– |
| SIGGRAPH Asia | 2022– |
| Nature | |
| Nature Communications | |
| Nature Photonics | |
| Optica | |
| Optics Express | |
| Science Advances | |
| IEEE Transactions on Computational Imaging | |
| IEEE Transactions on Pattern Analysis and Machine Intelligence | |

## Teaching

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|---|---|
| **University of Toronto** | **Instructor** |
| *CSC420: Introduction to Image Understanding* | *2023* |
| **University of Toronto** | **Instructor** |
| *CSC2529: Computational Imaging* | *2022* |
| **Stanford University** | **Instructor** |
| *EE367/CS448i: Computational Imaging* | *2022* |
| **Stanford University** | **Teaching Assistant** |
| *EE367/CS448i: Computational Imaging* | *2020* |
| **ACM SIGGRAPH** | **Instructor** |
| *Computational Time-Resolved Imaging, Single-Photon Sensing and Non-Line-of-Sight Imaging* | *2020* |

## Journal Publications

[J12]   J. N. P. Martel, **D. B. Lindell**, C. Z. Lin, E. R. Chan, M. Monteiro, G. Wetzstein, "ACORN: Adaptive coordinate networks for neural scene representation," *ACM Transactions on Graphics (SIGGRAPH)*, vol. 40, no. 4, pp. 1–13, 2021.

[J11]   **D. B. Lindell** and G. Wetzstein, "Three-dimensional imaging through scattering media based on confocal diffuse tomography," *Nature Communications*, vol. 11, no. 4517, 2020.

[J10]   C. A. Metzler, **D. B. Lindell**, G. Wetzstein, "Keyhole imaging: Non-line-of-sight imaging and tracking of moving objects along a single optical path at long standoff distances," *IEEE Transactions on Computational Imaging*, vol. 7, pp. 1–12, 2020.

[J9]   Z. Sun, **D. B. Lindell**, O. Solgaard, G. Wetzstein, "SPADnet: Deep RGB-SPAD sensor fusion assisted by monocular depth estimation," *Optics Express*, vol. 28, no. 10, pp. 14 948–14 962, 2020.

[J8]   F. Heide, M. O'Toole, K. Zang, **D. B. Lindell**, S. Diamond, G. Wetzstein, "Non-line-of-sight imaging with partial occluders and surface normals," *ACM Transactions on Graphics (ToG)*, vol. 38, no. 3, 2019.

[J7]   **D. B. Lindell**, G. Wetzstein, M. O'Toole, "Wave-based non-line-of-sight imaging using fast f-k migration," *ACM Transactions on Graphics (SIGGRAPH)*, vol. 38, no. 4, 2019.

[J6]   F. Heide, S. Diamond, **D. B. Lindell**, G. Wetzstein, "Sub-picosecond photon-efficient 3D imaging using single-photon sensors," *Scientific Reports*, vol. 8, no. 17726, 2018.

[J5]　**D. B. Lindell**, M. O'Toole, G. Wetzstein, "Single-photon 3D imaging with deep sensor fusion," *ACM Transactions on Graphics (SIGGRAPH)*, vol. 37, no. 4, 2018.

[J4]　M. O'Toole, **D. B. Lindell**, G. Wetzstein, "Confocal non-line-of-sight imaging based on the light-cone transform," *Nature*, vol. 555, no. 7696, pp. 338–341, 2018.

[J3]　**D. B. Lindell** and D. G. Long, "High-resolution soil moisture retrieval with ASCAT," *IEEE Geoscience and Remote Sensing Letters*, vol. 13, no. 7, pp. 972–976, 2016.

[J2]　**D. B. Lindell** and D. G. Long, "Multiyear Arctic ice classification using ASCAT and SSMIS," *Remote Sensing*, vol. 8, no. 4, p. 294, 2016.

[J1]　**D. B. Lindell** and D. G. Long, "Multiyear Arctic sea ice classification using OSCAT and QuikSCAT," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 54, no. 1, pp. 167–175, 2016.

# Conference Publications

[C17]　S. Sinha, J. Y. Zhang, A. Tagliasacchi, I. Gilitschenski, **D. B. Lindell**, "SparsePose: Sparse-view camera pose regression and refinement," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.

[C16]　A. W. Bergman, P. Kellnhofer, Y. Wang, E. R. Chan, **D. B. Lindell**, G. Wetzstein, "Generative neural articulated radiance fields," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

[C15]　C. Z. Lin, **D. B. Lindell**, E. R. Chan, G. Wetzstein, "3D GAN inversion for controllable portrait image animation," in *ECCV 2022 Workshop on Learning to Generate 3D Shapes and Scenes*, 2022.

[C14]　**D. B. Lindell**, D. Van Veen, J. J. Park, G. Wetzstein, "BACON: Band-limited coordinate networks for neural scene representation," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022, **(Oral)**.

[C13]　S. Shekarforoush, **D. B. Lindell**, D. J. Fleet, M. A. Brubaker, "Residual multiplicative filter networks for multiscale reconstruction," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

[C12]　D. Van Veen, R. Van der Sluijs, B. Ozturkler, A. D. Desai, C. Bluethgen, R. D. Boutin, M. H. Willis, G. Wetzstein, **D. B. Lindell**, S. Vasanawala, J. Pauly, A. S. Chaudhari, "Scale-agnostic super-resolution in MRI using feature-based coordinate networks," in *Medical Imaging with Deep Learning*, 2022.

[C11]　Q. Zhao, **D. B. Lindell**, G. Wetzstein, "Learning to solve PDE-constrained inverse problems with graph networks," in *International Conference on Machine Learning (ICML)*, 2022.

[C10]　**D. B. Lindell**, J. N. P. Martel, G. Wetzstein, "AutoInt: Automatic integration for fast neural volume rendering," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.

[C9]　A. W. Bergman, **D. B. Lindell**, G. Wetzstein, "Deep adaptive LiDAR: End-to-end optimization of sampling and depth completion at low sampling rates," in *IEEE International Conference on Computational Photography (ICCP)*, 2020.

[C8]　**D. B. Lindell**, M. O'Toole, G. Wetzstein, "Efficient non-line-of-sight imaging with computational single-photon imaging," in *Advanced Photon Counting Techniques XIV*, SPIE, 2020.

[C7]　**D. B. Lindell** and G. Wetzstein, "Confocal diffuse tomography for single-photon 3D imaging through highly scattering media," in *Computational Optical Sensing and Imaging (COSI)*, OSA, 2020.

[C6]　M. Nishimura, **D. B. Lindell**, C. A. Metzler, G. Wetzstein, "Disambiguating monocular depth estimation with a single transient," in *European Conference on Computer Vision (ECCV)*, 2020.

[C5]　V. Sitzmann, J. N. P. Martel, A. W. Bergman, **D. B. Lindell**, G. Wetzstein, "Implicit neural representations with periodic activation functions," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2020, **(Oral)**.

[C4]　S. I. Young, **D. B. Lindell**, B. Girod, D. Taubman, G. Wetzstein, "Non-line-of-sight surface reconstruction using the directional light-cone transform," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020, **(Oral)**.

[C3]　**D. B. Lindell**, G. Wetzstein, V. Koltun, "Acoustic non-line-of-sight imaging," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019, **(Oral)**.

[C2]　**D. B. Lindell**, M. O'Toole, G. Wetzstein, "Towards transient imaging at interactive rates with single-photon detectors," in *IEEE International Conference on Computational Photography (ICCP)*, 2018.

[C1]   M. O'Toole, F. Heide, **D. B. Lindell**, K. Zang, S. Diamond, G. Wetzstein, "Reconstructing transient images from single-photon sensors," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017, **(Spotlight)**.

## Public Demonstrations

[D2]   M. O'Toole, **D. B. Lindell**, G. Wetzstein, "Real-time non-line-of-sight imaging," in *ACM SIGGRAPH Emerging Technologies*, 2018.

[D1]   M. O'Toole, **D. B. Lindell**, G. Wetzstein, "Real-time non-line-of-sight imaging," in *CVPR Demos*, 2018.

## Theses

**2021**: Computational Imaging with Single-Photon Detectors. Ph.D. Thesis.

**2016**: Arctic Sea Ice Classification and Soil Moisture Estimation Using Microwave Sensors. Master's Thesis.

## Invited Talks

**2022**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, University of Windsor, Windsor, ON.

**2022**: Recent Advances in Non-Line-of-Sight Imaging, IEEE Signal Processing Society, Virtual.

**2022**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, Purdue Computational Imaging Seminar, Virtual.

**2022**: Confocal Non-Line-of-Sight Imaging and Diffuse Tomography Using Single-Photon Sensors, Imaging and Applied Optics Congress, Vancouver, BC.

**2022**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, Caltech, Pasadena, CA.

**2022**: Implicit Neural Representation Networks for Fitting Signals, Derivatives, and Integrals, Silicon Valley ACM SIGGRAPH Chapter, Virtual.

**2021**: Implicit Neural Representation Networks for Fitting Signals, Derivatives, and Integrals, Samsung AI Centre, Virtual.

**2021**: Implicit Neural Representation Networks for Fitting Signals, Derivatives, and Integrals, University of Erlangen-Nuremberg, Virtual.

**2021**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, University of Michigan, Virtual.

**2021**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, MIT RLE, Virtual.

**2021**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, University of Chicago, Virtual.

**2021**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, University of Toronto, Virtual.

**2021**: Physics-Based Visual Computing for Efficient 3D Vision and Sensing, Texas A&M, Virtual.

**2021**: AutoInt: Automatic Integration for Fast Neural Volume Rendering, Google, Virtual.

**2020**: Implicit Neural Representation Networks for Fitting Signals, Derivatives, and Integrals, Graphics and Mixed Environment Seminar (GAMES), Virtual.

**2020**: A Camera to See Around Corners, Playground/Akasha Imaging, Palo Alto, CA.

**2019**: A Camera to See Around Corners, TEDxBeaconStreet, Boston, MA.

**2019**: Computational Imaging with Single-Photon Detectors, Boston University Center for Information & Systems Engineering (CISE), Boston, MA.

**2019**: Efficient Confocal Non-Line-of-Sight Imaging, MIT RLE, Cambridge, MA.

**2019**: Efficient Confocal Non-Line-of-Sight Imaging, MIT Media Lab, Cambridge, MA.

**2019**: Computational Imaging with Single-Photon Detectors, Berkeley Center for Computational Imaging, Berkeley, CA.

**2019**: Computational Single-Photon Imaging, Silicon Valley ACM SIGGRAPH Chapter, San Jose, CA.

**2019**: Computational Imaging with Single-Photon Detectors, Stanford Center for Image Systems Engineering (SCIEN), Stanford, CA.

**2019**: Computational Single-Photon Imaging, Carnegie Mellon University Graphics Lab, Pittsburgh, PA.

## PhD Advising

Anagh Malik                                    Sep 2022–
*PhD Candidate, University of Toronto*

Samarth Sinha                                  Sep 2022–
*PhD Candidate, University of Toronto*
Co-advised with Igor Gilitschenski

Esther Lin                                     Sep 2022–
*PhD Candidate, University of Toronto*
Co-advised with Kyros Kutulakos

## Masters Advising

Kartik Kumar                            May 2023–Dec 2023
*MScAC, University of Toronto*
Co-advised with DNEG

Yihan (Nick) Ni                         May 2023–Dec 2023
*MScAC, University of Toronto*
Co-advised with DNEG

Kejia Yin                               May 2023–Dec 2023
*MScAC, University of Toronto*
Co-advised with MODIFACE

Vahid Zehtab                            May 2023–Dec 2023
*MScAC, University of Toronto*
Co-advised with Samsung

Vahid Zehtab                            May 2023–Dec 2023
*MScAC, University of Toronto*
Co-advised with Samsung

EJay Guo                                May 2022–Dec 2022
*MScAC, University of Toronto*
Co-advised with DNEG

## Undergraduates

Rishit Dagli                                   Jan 2023–
*University of Toronto*

Roland Gao                                     Jan 2023–
*University of Toronto*

Noah Juravsky                                  May 2023–
*University of Toronto*

Dorsa Molaverdikhani                           Jan 2023–
*University of Toronto*

Haojun Qiu                                     Sep 2022–
*University of Toronto*

Zach Salehe                                    Jan 2023–
*University of Toronto*

Kevin Vaidyan                                  May 2023–
*University of Toronto*

Shresth Grover                                 May 2023–
*IIT Kanpur*

Junru Lin                               Sep 2022–May 2023
*University of Toronto*

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| Justin Tran | Sep 2022–May 2023 |
| *University of Toronto* | |
| Thesis: Generative 3D shape modeling using latent space diffusion | |
| Skyler Zhang | Sep 2022–May 2023 |
| *University of Toronto* | |
| Thesis: Towards coded high-speed video acquisition using diffusion models | |
| Shahmeer Athar | Jan 2023–May 2023 |
| *University of Toronto* | |
| Zixin Guo | Jan 2023–May 2023 |
| *University of Toronto* | |
| Qing (Amy) Lyu | Jan 2023–May 2023 |
| *University of Toronto* | |
| Louis Zhang | Jan 2023–May 2023 |
| *University of Toronto* | |
| Shahmeer Athar | Jan 2023–May 2023 |
| *University of Toronto* | |
| Zixin Guo | Jan 2023–May 2023 |
| *University of Toronto* | |
| Qing (Amy) Lyu | Jan 2023–May 2023 |
| *University of Toronto* | |
| Louis Zhang | Jan 2023–May 2023 |
| *University of Toronto* | |