David B. Lindell

Curriculum Vitae

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Current Appointments

7/2022– **Asst. Professor**, *Dept. of Computer Science*, University of Toronto, Toronto, ON

7/2022– **Faculty Affiliate**, Vector Institute, Toronto, ON

Education

9/2016–1/2021 **Ph.D.**, *Electrical Engineering*, Stanford University, Stanford, CA
Committee: Gordon Wetzstein, Bernd Girod, Mark Horowitz, Vivek Goyal, James Harris

9/2015–4/2016 **M.Sc.**, *Electrical Engineering*, Brigham Young University, Provo, UT
Advisor: David G. Long

9/2009–4/2015 **B.Sc.**, *Electrical Engineering*, Brigham Young University, Provo, UT
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

1/2021–4/2022 **Postdoctoral Scholar**, *Electrical Engineering*, Stanford University, Stanford, CA

6/2018–11/2018 **Intern**, *Intelligent Systems Lab*, Intel Corporation, Santa Clara, CA
Advisor: Vladlen Koltun

6/2016–7/2016 **Intern**, Rincon Research Corporation, Tucson, AZ

Service

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) 2021

CVPR Workshop on Computational Cameras and Displays (CCD) 2020

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

Paper Reviewer Nature, Nature Communications, Nature Photonics, Science Advances, Optica, Optics Express, CVPR (2020–), ECCV (2020–), ICCV (2021–), ICCP (2019–), ICLR (2021–), NeurIPS (2021–), SIGGRAPH (2020–), SIGGRAPH Asia (2022–), TCI, TPAMI

Member ACM, IEEE

Teaching

Instructor Introduction to Image Understanding, CSC420 (University of Toronto W2022)

Instructor Computational Imaging, CSC2529 (University of Toronto F2022)

Co-Instructor	Computational Imaging, EE367/CS448i (Stanford W2022)
Teaching Assistant	Computational Imaging, EE367/CS448i (Stanford W2020)
Instructor/Organizer	Computational Time-Resolved Imaging, Single-Photon Sensing and Non-Line-of-Sight Imaging (ACM SIGGRAPH 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 sea ice classification using OSCAT and QuikSCAT," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 54, no. 1, pp. 167–175, 2016.

[J1] **D. B. Lindell** and D. G. Long, "Multiyear Arctic ice classification using ASCAT and SSMIS," *Remote Sensing*, vol. 8, no. 4, p. 294, 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," 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. 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)**.

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.

Public Demonstrations

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

2018 **Real-time non-line-of-sight imaging**, *M. O'Toole, D.B. Lindell, G. Wetzstein*, 2018, IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

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

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

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.

Mentorship

University of Toronto

Ph.D. **Anagh Malik**, *University of Toronto*, Sep 2022–

Sam Sinha, *University of Toronto*, Sep 2022–
Co-advised with Igor Gilitschenski

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

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

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

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

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

Undergraduate **Junru Lin**, *University of Toronto*, Sep 2022–

Haojun Qiu, *University of Toronto*, Sep 2022–

Justin Tran, *University of Toronto*, Sep 2022–

Skyler Zhang, *University of Toronto*, Sep 2022–

Shahmeer Athar, *University of Toronto*, Jan 2023–

Rishit Dagli, *University of Toronto*, Jan 2023–

Zixin Guo, *University of Toronto*, Jan 2023–

Qing (Amy) Lyu, *University of Toronto*, Jan 2023–

Dorsa Molaverdikhani, *University of Toronto*, Jan 2023–

Zach Salehe, *University of Toronto*, Jan 2023–

Louis Zhang, *University of Toronto*, Jan 2023–

Stanford University

Ph.D. **Axel Levy**, *Stanford*, Fall 2021

Dave Van Veen, *Stanford*, Fall 2021

William Meng, *Stanford*, Summer 2021

Qingqing Zhao, *Stanford*, Fall 2020

Manu Gopakumar, *Stanford*, Fall 2020

Thomas Teisberg, *Stanford*, Fall 2019

Alex Bergman, *Stanford*, Summer 2019

Mark Nishimura, *Stanford*, Summer 2019

Zhanghao Sun, *Stanford*, Winter 2019

High School **Jason Corona**, *South San Francisco High School CA*, 2019–2020