

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) 2019–2021
Paper Reviewer Nature, Nature Communications, Nature Photonics, Science Advances, SIGGRAPH, SIGGRAPH Asia, TPAMI, CVPR, ECCV, ICCV, TCI, ICCP, Optics Express, ICLR, NeurIPS
Member ACM, IEEE

Teaching

- Instructor Computational Imaging, CSC2529 (University of Toronto F2022)
Co-Instructor Computational Imaging, EE367/CS448i (Stanford W2022)
Teaching Assistant Computational Imaging, EE367/CS448i (Stanford W2020)

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

- [C14] 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.
- [C13] **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)**.
- [C12] 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.
- [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, 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*, Summer 2022–
- Sam Sinha**, *University of Toronto*, Summer 2022–
- MScAC** **EJay Guo**, *University of Toronto*, Summer 2022–
- Undergraduate** **Skyler Zhang**, *University of Toronto*, Summer 2022–
- Justin Tran**, *University of Toronto*, Summer 2022–

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