

# 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

- 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)

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## 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)*, 2021, Accepted.
- [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.

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## Conference Publications

- [C11] **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)**.
- [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)**.

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## 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.

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## 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)

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## Invited Talks

- 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** **Skylar 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