David B. Lindell

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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 M.Sc. Electrical Engineering	Provo, UT 2015–2016
Advisor: David G. Long	2013–2010
Brigham Young University	Provo, UT
B.Sc. Electrical Engineering	2009–2015
Advisors: David G. Long, Aaron Hawkins	
Awards	
Google Research Scholar Award	2024
Sony Focused Research Award	2023
Sony Faculty Innovation Award	2023
Marr Prize	2023
Connaught New Researcher Award	2023
ACM SIGGRAPH Outstanding Doctoral Dissertation Honorable Mention	2021
ACM SIGGRAPH Thesis Fast Forward Honorable Mention	2020
CVPR Outstanding Reviewer	2020
Stanford Graduate Research Fellowship	2016-2020
BYU Office of Research & Creative Activities Grant	2015
Tau Beta Pi Scholarship	2014
BYU Heritage Scholarship	2012–2015
Previous Professional Experience	
•	Stanford CA
Stanford University Postdoctoral Scholar	Stanford, CA 2021–2022
Advisor: Gordon Wetzstein	2021 2022
Intelligent Systems Lab, Intel Corporation Intern	Santa Clara, CA 2018
Advisor: Vladlen Koltun Rincon Research Corporation	Tucson, AZ
Intern	2016

Conference Organization/Editorial Positions

Associate Editor: IEEE Transactions on Computational Imaging	2023-2024
Area Chair: Neural Information Processing Systems (NeurIPS)	2023, 2024
Area Chair: IEEE Conference on Computer Vision and Pattern Recognition (CVPR)	2023, 2024
Finance Co-Chair: Int. Conference on Computational Photography (ICCP)	2022
Program Chair: Int. Conference on Computational Photography (ICCP)	2025
Program Chair: IEEE Workshop on Computational Cameras and Displays (CCD)	2020,2021,2023
Program Committee: Int. Conference on Computational Photography (ICCP)	2019–2024
Technical Papers Committee: SIGGRAPH Asia	2023

Referee Service

CVPR	2020–
ECCV	2020-
ICCV	2021–
ICCP	2019–
ICLR	2021–
NeurIPS	2021–
SIGGRAPH	2020-
SIGGRAPH Asia	2022–
WACV	2024-

Nature

Nature Communications

Nature Photonics

Optica

Optics Express

Science Advances

IEEE Transactions on Computational Imaging

IEEE Transactions on Pattern Analysis and Machine Intelligence

University Service

AI Curriculum Committee: Computer Science Department, University of Toronto	2023-2024
Undergraduate Affairs Committee: Computer Science Department, University of Toronto	2022-2024
Outreach Committee: Computer Science Department, University of Toronto	2023-2024

Teaching

University of Toronto CSC2529: Computational Imaging	Instructor 2022,2023
University of Toronto CSC420: Introduction to Image Understanding	Instructor 2023,2024
AAAI Conference on Artificial Intelligence AI for Emerging Inverse Problems in Computational Imaging	Instructor 2024
Stanford University EE367/CS448i: Computational Imaging	Instructor 2022
Stanford University EE367/CS448i: Computational Imaging	Teaching Assistant 2020

2020

Journal Publications

- [J13] C. Shentu, E. Li, C. Chen, P. T. Dewi, **D. B. Lindell**, J. Burgner-Kahrs, "MoSS: Monocular shape sensing for continuum robots," *IEEE Robotics and Automation Letters*, 2023.
- [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. 14948–14962, 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

- [C27] S. Bahmani, X. Liu, Y. Wang, I. Skorokhodov, V. Rong, Z. Liu, X. Liu, J. J. Park, S. Tulyakov, G. Wetzstein, A. Tagliasacchi, D. B. Lindell, "TC4D: Trajectory-conditioned text-to-4D generation," in European Conference on Computer Vision (ECCV), 2024.
- [C26] S. Bahmani, I. Skorokhodov, V. Rong, G. Wetzstein, L. Guibas, P. Wonka, S. Tulyakov, J. J. Park, A. Tagliasacchi, D. B. Lindell, "4D-fy: Text-to-4D generation using hybrid score distillation sampling," in IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.
- [C25] A. Malik, N. Juravsky, R. Po, G. Wetzstein, K. N. Kutulakos, **D. B. Lindell**, "Flying with photons: Rendering novel views of propagating light," in *European Conference on Computer Vision (ECCV)*, 2024, (**Oral**).
- [C24] P. Mirdehghan, B. Buscaino, M. Wu, D. Charlton, M. E. Mousa-Pasandi, K. N. Kutulakos, **D. B. Lindell**, "Coherent optical modems for full-wavefield lidar," in *ACM SIGGRAPH Asia*, 2024.
- [C23] P. Mirdehghan, M. Wu, W. Chen, **D. B. Lindell**, K. N. Kutulakos, "TurboSL: Dense, accurate and fast 3D by neural inverse structured light," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.
- [C22] R. Rangel, X. Sun, A. Barman, R. Gulve, S. Bajic, J. Wang, H. Wang, **D. B. Lindell**, K. N. Kutulakos, R. Genov, "23,000-exposures/s 360fps-readout software-defined image sensor with motion-adaptive spatially varying imaging speed," in *IEEE Symposium on VLSI Technology and Circuits*, 2024.

- [C21] K. Yin, V. Rao, R. Jiang, X. Liu, P. Aarabi, **D. B. Lindell**, "SCE-MAE: Selective correspondence enhancement with masked autoencoder for self-supervised landmark estimation," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.
- [C20] R. Gulve, R. Rangel, A. Barman, D. Nguyen, M. Wei, M. A. Sakr, X. Sun, **D. B. Lindell**, K. N. Kutulakos, R. Genov, "Dual-port CMOS image sensor with regression-based HDR flux-to-digital conversion and 80 ns rapid-update pixel-wise exposure coding," in *IEEE International Solid-State Circuits Conference (ISSCC)*, 2023.
- [C19] A. Malik, P. Mirdehghan, S. Nousias, K. N. Kutulakos, **D. B. Lindell**, "Transient neural radiance fields for lidar view synthesis and 3d reconstruction," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2023, (**Spotlight**).
- [C18] 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.
- [C17] M. Wei, S. Nousias, R. Gulve, **D. B. Lindell**, K. N. Kutulakos, "Passive ultra-wideband single-photon imaging," in *IEEE/CVF International Conference on Computer Vision (ICCV)*, 2023, (**Marr Prize**).
- [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**).

Non-Refereed Publications

- [P3] S. Bahmani, I. Skorokhodov, A. Siarohin, W. Menapace, G. Qian, M. Vasilkovsky, H.-Y. Lee, C. Wang, J. Zou, A. Tagliasacchi, **D. B. Lindell**, S. Tulyakov, "Vd3d: Taming large video diffusion transformers for 3d camera control," *arXiv preprint arXiv:*2407.12781, 2024.
- [P2] S. Shekarforoush, **D. B. Lindell**, M. A. Brubaker, D. J. Fleet, "Improving ab-initio cryo-em reconstruction with semi-amortized pose inference," *arXiv preprint arXiv*:2406.10455, 2024.
- [P1] E. Y. Lin, Z. Wang, R. Lin, D. Miau, F. Kainz, J. Chen, X. C. Zhang, **D. B. Lindell**, K. N. Kutulakos, "Learning lens blur fields," *arXiv preprint arXiv:2310.11535*, 2023.

Public Demonstrations

- [D3] R. Gulve, R. Rangel, A. Barman, D. Nguyen, M. Wei, M. A. Sakr, X. Sun, **D. B. Lindell**, K. N. Kutulakos, R. Genov, "Low-cost coded-exposure pixel cameras for robust high-speed computational imaging at up to 18,000 exposures per second," in *CVPR Demos*, 2023.
- [D2] M. O'Toole, **D. B. Lindell**, G. Wetzstein, "Real-time non-line-of-sight imaging," in *ACM SIG-GRAPH 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

2024: Imaging Anytime Anywhere: Capturing Dynamic Scenes from Seconds to Picoseconds, IMSI Workshop on Computational Imaging, Chicago, IL

2024: Imaging Anytime Anywhere All at Once: Capturing Dynamic Scenes from Seconds to Picoseconds, UC Berkeley Photobears, Berkeley, CA

2024: Imaging Anytime Anywhere All at Once: Capturing Dynamic Scenes from Seconds to Picoseconds, Stanford Center for Image Systems Engineering (SCIEN), Stanford, CA

2024: Flying with Photons: Rendering Novel Views of Propagating Light, Conference on Robots and Vision, Guelph, ON

2024: Text-to-4D Generation Using Hybrid Score Distillation Sampling, UTMIST Immersion Night, Toronto, ON

2024: Passive Ultra-Wideband Single-Photon Imaging, Stanford EE367 Computational Imaging (Guest Lecture), Virtual

2024: From Pixels to Perception: Artificial Intelligence and Computer Vision, DGP Academy, Toronto, ON

2024: Passive Ultra-Wideband Single-Photon Imaging, Simon Fraser University (GrUVi Lab), Vancouver, BC

2024: Passive Ultra-Wideband Single-Photon Imaging, National Research Council Ultrafast Quantum Photonics Group, Ottawa, ON

2023: Passive Ultra-Wideband Single-Photon Imaging, 3rd International Computational Imaging Conference, Virtual

2023: From Pixels to Perception: Artificial Intelligence and Computer Vision, Leadership by Design Workshop, Toronto, ON

2023: Neural Rendering at One Trillion Frames per Second, UTMIST EigenAI ML Conference, Toronto, ON

2023: Passive Ultra-Wideband Single-Photon Imaging, Photons Canada, Virtual

2023: Neural Rendering at One Trillion Frames per Second, BIRS Workshop on Generative 3D Models, Banff, AB

2023: Passive Ultra-Wideband Single-Photon Imaging, Photonics North, Montreal, QC

2023: 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 Webinar, 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

 $\textbf{2020}: Implicit\ Neural\ Representation\ Networks\ for\ Fitting\ Signals,\ Derivatives,\ and\ Integrals,\ Graphics\ and\ Mixed\ Environment\ Seminar\ (GAMES),\ Virtual$

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

 $\textbf{2019}: \ Computational \ Imaging \ with \ Single-Photon \ Detectors, \ Stanford \ Center \ for \ Image \ Systems \ Engineering \ (SCIEN), \ Stanford, \ CA$

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

PhD Advising

Felix Taubner *University of Toronto*

Sep 2024-

Sherwin Bahmani *University of Toronto*

Sep 2023-

Victor Rong University of Toronto Co-advised with Kyros Kutulakos	Sep 2023–
Anagh Malik University of Toronto	Sep 2022–
Samarth Sinha <i>University of Toronto</i> Co-advised with Igor Gilitschenski	Sep 2022–
Esther Lin University of Toronto Co-advised with Kyros Kutulakos	Sep 2022–
Master's Advising	
Andrew Guo MSc, University of Toronto	Sep 2024–
Andrew Xie MSc, University of Toronto	Sep 2024–
Kelly Zhu MSc, University of Toronto	Sep 2024–
Maxx Wu MSc, University of Toronto Co-advised with Kyros Kutulakos	Sep 2023–
Umar Masud MScAC, University of Toronto Samsung	May 2024–Dec 2024
Steven Hyun MScAC, University of Toronto Samsung	May 2024–Dec 2024
Faraz Ali MScAC, University of Toronto Samsung	May 2024–Dec 2024
Carolina Villamizar MScAC, University of Toronto DWave	May 2024–Dec 2024
Kartik Kumar MScAC, University of Toronto DNEG	May 2023–Dec 2023
Yihan (Nick) Ni MScAC, University of Toronto DNEG	May 2023–Dec 2023
Kejia Yin <i>MScAC, University of Toronto</i> MODIFACE	May 2023–Dec 2023
Vahid Zehtab MScAC, University of Toronto Samsung	May 2023–Dec 2023
EJay Guo MScAC, University of Toronto DNEG	May 2022–Dec 2022

Visiting Students

Siddharth Somasundaram MIT	Sep 2024–Dec 2024
Co-advised with Kyros Kutulakos	
Michael Neumayr TUM	Sep 2024–Apr 2025
Undergraduate Advising	
Allison Lau University of Toronto	Sep 2024–
Koichi Namekata University of Toronto	July 2024–
Howard Xiao <i>University of Toronto</i> NSERC Undergraduate Student Research Award	May 2024–
Mehar Khurana IIT Madras Mitacs Globalink	May 2024–
Weihan Luo University of Toronto	Sep 2023–
Zixin Guo University of Toronto University of Toronto Excellence Award	Jan 2023–
Zach Salehe University of Toronto NSERC Undergraduate Student Research Award	Jan 2023–May 2024
Jason Zhu University of Toronto	Sep 2023–May 2024
Steven Luo University of Toronto	Jan 2024–May 2024
Ariel Chen University of Toronto	Sep 2023–May 2024
Haojun Qiu University of Toronto	Sep 2022–May 2024
Andrew Qiu University of Toronto	Sep 2023–Dec 2023
Kevin Vaidyan University of Toronto	May 2023–May 2024
Noah Juravsky University of Toronto	May 2023–May 2024
Dorsa Molaverdikhani University of Toronto	Jan 2023–May 2024
Shahmeer Athar University of Toronto	Jan 2023–May 2024
Rishit Dagli University of Toronto	Jan 2023–Dec 2023
Roland Gao <i>University of Toronto</i> NSERC Undergraduate Student Research Award	Jan 2023–Sep 2023

Qing (Amy) Lyu Jan 2023-May 2023 University of Toronto Louis Zhang Jan 2023-May 2023 University of Toronto Junru Lin Sep 2022-May 2023 University of Toronto 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