

# David Lindell

☎ (507) 514 2491 • ✉ lindell@stanford.edu • 🌐 davidlindell.com  
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## Education

**Stanford University** Sept 2016 – Present  
Ph.D. Electrical Engineering  
**Brigham Young University** Sept 2009 – Apr 2016  
M.S. Electrical Engineering  
B.S. Electrical Engineering (4.00/4.00) *Summa Cum Laude*

## Research Experience

**Ph.D. Candidate** Sept 2016 – Present  
Stanford University  
*Advisor:* Prof. Gordon Wetzstein  
*Area:* Computational imaging, time-of-flight sensors, LIDAR systems  
◦ Machine learning for 3D imaging, sensor fusion, transient imaging, non-line-of-sight imaging

**Research Assistant** May 2014 – Apr 2016  
Brigham Young University  
*Advisor:* Prof. David Long  
*Area:* Radar image processing, geoscience, remote sensing  
◦ Arctic sea ice classification and soil moisture estimation

## Publications

### Journal Articles

- [8] **D. B. Lindell**, G. Wetzstein, M. O'Toole, "Wave-based non-line-of-sight imaging using fast f-k migration," *ACM Trans. Graph. (SIGGRAPH)*, vol. 38, no. 4, 2019.
- [7] 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 Trans. Graph.*, 2019.
- [6] **D. B. Lindell**, M. O'Toole, G. Wetzstein, "Single-photon 3D imaging with deep sensor fusion," *ACM Trans. Graph. (SIGGRAPH)*, vol. 37, no. 4, 2018.
- [5] 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.
- [4] 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, p. 338, 2018.
- [3] **D. B. Lindell** and D. G. Long, "High-resolution soil moisture retrieval with ASCAT," *IEEE Geosci. Remote Sens. Lett.*, vol. 13, no. 7, pp. 972–976, 2016.
- [2] **D. B. Lindell** and D. G. Long, "Multiyear Arctic ice classification using ASCAT and SSMIS," *Remote Sensing*, vol. 8, no. 4, p. 294, 2016.
- [1] **D. B. Lindell** and D. G. Long, "Multiyear Arctic sea ice classification using OSCAT and QuikSCAT," *IEEE Trans. Geosci. Remote Sens.*, vol. 54, no. 1, pp. 167–175, 2016.

### Conference Proceedings

- [4] 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, oral)*, 2020.
- [3] **D. B. Lindell**, G. Wetzstein, V. Koltun, "Acoustic non-line-of-sight imaging," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR, oral)*, 2019.
- [2] **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.
- [1] 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, spotlight)*, 2017.

## Industry Experience

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### Intel Intelligent Systems Lab

June 2018 – September 2018

#### Intern

- o Worked with Vladlen Koltun on acoustic non-line-of-sight imaging.

### Software For Hire

March 2016 – June 2019

#### Computer Vision Consultant

- o Developed and shipped computer vision algorithms deployed on a pharmaceutical tablet counter (<https://www.eyecnvpc.com/>).
- o Built neural-net-based algorithm for recognition and counting using PyTorch and MXNet; achieved real-time performance for product deployed on Intel CPUs.
- o Designed real-time multithreaded vision algorithm for tablet counting using hand-crafted features with Boost, OpenCV, and Point Cloud Library.

### Rincon Research Corporation

June 2016 – July 2016

#### Electrical Engineering Intern

- o Developed a cloud-based digital video recording system to stream and record live video. Integrated live broadcast television demodulation capability using GNU Radio and proprietary signal processing hardware.

## Invited Talks

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- o **Carnegie Mellon University Graphics Lab**, *Computational Single-Photon Imaging*, 1/23/2019.
- o **Stanford Center for Image Systems Engineering**, *Computational Imaging with Single-Photon Detectors*, 5/8/2019.
- o **Silicon Valley ACM SIGGRAPH Chapter**, *Computational Single-Photon Imaging*, 5/30/2019.
- o **Berkeley Center for Computational Imaging**, *Computational Imaging with Single-Photon Detectors*, 9/4/2019.
- o **MIT Research Laboratory of Electronics**, *Efficient Confocal Non-Line-of-Sight Imaging*, 11/21/2019.
- o **Boston University Center for Information & Systems Engineering**, *Computational Imaging with Single-Photon Detectors*, 11/22/2019.
- o **TEDxBeaconStreet 2019**, *A camera to see around corners*, 11/23/2019.

## Graduate Coursework

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- o Machine Learning (CS-229), A. Ng F2018
- o Convex Optimization (EE-364A), S. Boyd Sp2017
- o Convolutional Neural Networks for Visual Recognition (CS-231N), F. Li Sp2017
- o Computational Imaging and Display (EE-367), G. Wetzstein W2017
- o Information Theory (EE 376), D. Tse W2017
- o The Fourier Transform and its Applications (EE-261), B. Osgood F2016
- o Linear Dynamical Systems (EE-263), R.N. Mahalati F2016
- o Detection and Estimation Theory (EE-672), M. Rice W2016
- o Continuous Phase Modulation (EE-682R), M. Rice W2016
- o Robotic Vision (EE-631), D.J. Lee W2016
- o Math of Signals and Systems (EE-671), B. Jeffs F2015
- o Stochastic Processes (EE-670), B. Mazzeo F2015
- o Medical Imaging & Image Reconstruction (EE-576), N. Bangerter F2015
- o Antennas and Propagation (EE-665), K. Warnick W2015
- o Microwave Remote Sensing (EE-568), D. Long F2014

## Honors & Awards

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- o Stanford Graduate Research Fellowship 2016 – 2019
- o Tau Beta Pi Honor Society Inducted 2013

- BYU Office of Research & Creative Activities Grant Winner 2015
- BYU Heritage Scholarship 2012 – 2015
- Tau Beta Pi Scholarship 2014

## Theses

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### Master's Thesis:

**Title:** Arctic Sea Ice Classification and Soil Moisture Estimation Using Microwave Sensors

**Supervisor:** David G. Long (Brigham Young University)

## Public Demonstrations

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