

# Michael R. Kellman

(301) 300 0583  
kellman@berkeley.edu  
people.eecs.berkeley.edu/~kellman

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EDUCATION	<p><b>University of California, Berkeley, Berkeley, CA</b> <b>2015 - present</b> <b>PhD in Electrical Engineering and Computer Science</b> Advised by Professors Laura Waller and Michael Lustig Funding: National Science Foundation Graduate Research Fellowship GPA: 3.76/4.00</p> <p><b>University of California, Berkeley, Berkeley, CA</b> <b>2015 - 2017</b> <b>MS in Electrical Engineering and Computer Science</b> Advised by Professor Michael Lustig</p> <p><b>Carnegie Mellon University, Pittsburgh, PA</b> <b>2011 - 2015</b> <b>BS in Electrical &amp; Computer Engineering</b> Carnegie Institute of Technology Honors and University Honors Dean's List: Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015 GPA: 3.78/4.00</p>
CURRENT RESEARCH	<p>The goal of my research is to improve the limitation of modern computational imaging systems. I'm particularly interested in the areas of signal processing, machine learning theory, image reconstruction algorithms, and optical modeling. Specifically, my work is focused on the applications of microscopy, medical imaging, and photography. My PhD dissertation topic is data-driven design methods for computational imaging systems.</p>
RESEARCH EXPERIENCE	<p><b>UC Berkeley, Graduate Student Researcher</b> <b>8/2017 - present</b></p> <ul style="list-style-type: none"><li>• Data-driven design for computational microscopy.</li><li>• Space-time modeling for high throughput quantitative phase imaging.</li></ul> <p><b>Google, Research Intern</b> <b>5/2019 - 8/2019</b> Developing machine learning and signal processing algorithms for modern burst photography on handheld devices.</p> <p><b>UC Berkeley, Graduate Student Researcher</b> <b>8/2015 - 8/2017</b> Applied spread spectrum code design to improve temporal resolution and SNR of high throughput point-of-care microfluidic devices.</p> <p><b>Carnegie Mellon University, Undergraduate Student Researcher</b> <b>5/2013 - 5/2015</b> Researched noise robust physiologically motivated features for automatic speech recognition and multi-speaker pitch detection.</p> <p><b>Carnegie Mellon University, Senior Design Project</b> <b>1/2015 - 5/2015</b></p> <ul style="list-style-type: none"><li>• Developed a mobile Android application to perform remote monitoring of heart rate using multi-spectral imaging from a video of a persons face by exploiting hue fluctuations in the forehead region due to blood pulsation.</li><li>• Performed blind source separation on spatially averaged RGB signals to isolate periodicities correlated with heart rate.</li></ul>

**Fitbit, Research & Development Intern** **5/2014 - 8/2014**

- Evaluated and developed new sensor technology and algorithms to perform heart rate and pulse oximetry.
- Developed and tested a tennis swing classification algorithm and other quantitative metrics for new fitness tracking devices.

**National Institutes of Health** **6/2011 - 8/2011**

Laboratory of Biomedical Stochastic Physics, Research Intern  
Developed a prototype acquisition system for wavelength optimized multi-spectral Oxy- and Deoxy- Hemoglobin imaging system.

**National Institutes of Health** **6/2010 - 8/2010**

Laboratory of Biomedical Stochastic Physics, Research Intern

- Developed a robust fluorescence lifetime estimator that accounts for blur due to the system response.
- Characterized the fluorescence lifetime - pH sensitivity relation for a new pH sensitive fluorescent dye for the application of detecting cancerous skin tissue.

PUBLICATIONS

**Memory-efficient Learning for Large-scale Computational Imaging**

**Michael Kellman**, Jon Tamir, Emrah Bostan, Michael Lustig, and Laura Waller  
*NeurIPS Deep Inverse Workshop, 2019*

**Data-Driven Design for Fourier Ptychographic Microscopy**

**Michael Kellman**, Emrah Bostan, Michael Chen, and Laura Waller  
*IEEE International Conference for Computational Photography, 2019*

**Physics-based Learned Design: Optimized Coded-Illumination for Quantitative Phase Imaging**

**Michael Kellman**, Emrah Bostan, Nicole Repina, and Laura Waller  
*IEEE Transactions on Computational Imaging, 2018*

**Motion-resolved Quantitative Phase Imaging**

**Michael Kellman**, Michael Chen, Zach Phillips, Michael Lustig, and Laura Waller  
*OSA Biomedical Optics Express, 2018*

**Node-Pore Coded Coincidence Correction: Coulter Counters, Code Design, and Sparse Deconvolution**

**Michael Kellman**, Francois Rivest, Alina Pechacek, Lydia Sohn, Michael Lustig  
*IEEE Sensors Journal, 2018.*

**Barker-Coded Node-Pore Resistive Pulse Sensing with Built-in Coincidence Correction**

**Michael Kellman**, Francois Rivest, Alina Pechacek, Lydia Sohn, Michael Lustig  
*IEEE ICASSP, 2017.*

SERVICE AND  
TEACHING

Berkeley EE16A Graduate Student Instructor	<b>8/2019 - 12/2019</b>
Berkeley EE16A Graduate Student Instructor	<b>8/2018 - 12/2018</b>
Berkeley Center for Computational Imaging Seminar Director	<b>8/2017 - 7/2018</b>
Carnegie Mellon University ECE 18-220 Lab TA	<b>8/2013 - 12/2013</b>

RELEVANT COURSE WORK	Learning and Optimization Optical Engineering Numerical Optimization Random Processes in Systems Advanced Digital Signal Processing Wavelets and Multi-resolution Techniques	Pattern Recognition Theory Linear Systems Computer Vision Design of Speech Recognition Systems Applied Electrodynamics Fundamentals of Electromagnetics
MEMBERSHIP	IEEE, SPIE, OSA, Eta Kappa Nu, UC Berkeley EE Graduate Student Association	