

Michael Kellman Ph.D.

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PROFESSIONAL SUMMARY

Electrical engineer and computer scientist seeking a position at a mission-driven company striving to make an environmental and societal impact. A talented engineer with a background in signal processing, machine learning, optimization, and statistics. Experience in optimization and signal processing from solving large-scale inverse problems to reconstruct high-dimensional image data in the fields of medical imaging and microscopy. Experience in machine learning and statistics from developing data-driven methods to optimize the experimental design and signal priors of computational imaging systems. A collaborator and communicator that enjoys working on a diverse team and empowering colleagues to bring their unique vision to the project.

EDUCATION

University of California, Berkeley, Berkeley, CA **2017 - 2020**

PhD in Electrical Engineering and Computer Science

Advised by Professors Laura Waller and Michael Lustig

Funding: National Science Foundation Graduate Research Fellowship

GPA: 3.76/4.00

University of California, Berkeley, Berkeley, CA **2015 - 2017**

MS in Electrical Engineering and Computer Science

Advised by Professor Michael Lustig

Carnegie Mellon University, Pittsburgh, PA **2011 - 2015**

BS in Electrical & Computer Engineering

Carnegie Institute of Technology Honors and University Honors

GPA: 3.78/4.00

RESEARCH EXPERIENCE

Post Doctoral Researcher - UC San Francisco **10/2020 - present**

Contributing signal processing expertise to a microscopy and biology group's development of deconvolution methods (ordinary and blind) to process Terabyte-scale light-sheet microscopy data. Researching computational data-driven methods to optimize the illumination and detection abilities of the light-sheet microscopy system.

Graduate Student Researcher - UC Berkeley **8/2017 - 8/2020**

Developed memory-efficient data-driven methods, physics-based learning, to optimize the design of large-scale computational imaging systems. Applied methods to learn signal priors for 3D multi-channel MRI and to learn experimental designs for super-resolved phase and optical diffraction tomographic microscopes.

Research Intern - Google Research **5/2019 - 8/2019**

Developed machine learning and signal processing algorithms for modern burst photography on handheld devices.

Graduate Student Researcher - UC Berkeley **8/2015 - 8/2017**

Applied spread spectrum code design to improve temporal resolution and SNR of high throughput point-of-care microfluidic Coulter counter devices.

Undergraduate Student Researcher - Carnegie Mellon University **5/2013 - 5/2015**

Researched noise robust physiologically motivated features for automatic speech recognition and multi-speaker pitch detection.

Senior Design Student - Carnegie Mellon University **1/2015 - 5/2015**
Developed a mobile Android application to perform remote monitoring of heart rate using multi-spectral imaging from a video of a person's face.

Research Intern - Fitbit **5/2014 - 8/2014**
Developed algorithms to estimate heart rate and pulse oximetry. Developed and tested a tennis swing classification algorithm.

SELECTED
PUBLICATIONS

Memory-efficient Learning for Large-scale Computational Imaging
Michael Kellman, Kevin Zhang, Eric Markley, Jon Tamir, Emrah Bostan, Michael Lustig, and Laura Waller
IEEE Transactions on Computational Imaging, October 2020

Deep Phase Decoder: Self-calibrating phase microscopy with an untrained deep neural network
Emrah Bostan, Reinhard Heckel, Michael Chen, **Michael Kellman**, and Laura Waller
OSA Optica, January 2020.

Data-Driven Design for Fourier Ptychographic Microscopy
Michael Kellman, Emrah Bostan, Michael Chen, and Laura Waller
IEEE International Conference on Computational Photography, May 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, March 2019.

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.

TEACHING AND
SERVICE

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