Zachary F. Phillips

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website | github | linkedIn | scholar

Final-year Ph.D. Candidate in the Waller Lab specializing in full-stack computational imaging systems development

Education

University of California, Berkeley

Ph.D. (In Progress), Graduate Group in Applied Science and Technology — 2014 - Present

- Cumulative GPA: 3.52 / 4.00
- Research Area: Computational Imaging System Design and Methods
- Research Advisor: Associate Professor Laura Waller

M.S., Graduate Group in Applied Science and Technology — 2014 - 2016

- Thesis: Coded Illumination Techniques for Phase Imaging and Motion Blur
- Research Advisor: Associate Professor Laura Waller

University of North Carolina, Chapel Hill

B.S. with Highest Honors, Applied Science and Engineering — 2009 - 2013

- Cumulative GPA: 3.33 / 4.00
- Research Advisor: Professor Amy L. Oldenburg

Experience

Waller Lab, University of California, Berkeley | Berkeley, CA

Graduate Student Researcher - (PI: Associate Professor Laura Waller) — May 2013 - Present

- Research in computational imaging systems development for phase imaging, coherent super-resolution, and high-throughput imaging
- Mentored 12 undergraduates for summer and semester projects

Apple | Cupertino, CA

Intern, Exploratory Design Group — May 2018 - August 2018

Spectral Coded Illumination, Inc. | Berkeley, CA

Co-Founder and CEO - website — January 2017 - Present

- Founded and managed spin-off company from Waller Lab
- Designed, fabricated, and sold LED microscope condensers to customers in US and Europe

DISP Lab, Duke University | Durham, NC

Associate in Research (Staff / Full-Time) - PI.: Professor David Brady — May 2013 - May 2014

- Primary optomechanical designer for AWARE 40, a 2.3 Gigapixel multi-aperture camera
- Work featured in NPR's *All Things Considered*

Optical Coherence Imaging Lab, UNC Chapel Hill | Chapel Hill, NC

Undergraduate Research Assistant - PI: Professor Amy Oldenburg — May 2011-May 2013

- Assisted with experiments using Optical Coherence Tomography system
- Maintained multiple epithelial cell lines for a period of 14 months

Relevant Awards

Eagle Scout | Boy Scouts of America — 2008

Qinf Fellowship Recipient | Qualcomm, Inc. — 2016 - 2017

Software Proficiencies

Python (numpy, scipy, arrayfire, distutils), Matlab, CAD (Solidworks, Fusion360), PCB Design and Fabrication (Autodesk EAGLE, KiCAD), LaTeX and MS Office, Git, Linux/Unix/Bash/zsh, C++ Development (Linux/gcc and embedded)

Publications

R. Eckert, **Z. Phillips** & L. Waller (July 2018). *Efficient illumination angle self-calibration in Fourier ptychography*. Applied Optics 57(19), 5434-5442 (2018). doi: 10.1364/AO.57.005434

Z.F. Phillips, M. Chen & L. Waller (13 May 2015). *Single-shot quantitative phase microscopy with color-multiplexed differential phase contrast (cDPC)*. PLoS ONE 12(2): e0171228. doi: 10.1371/journal.pone.0171228

Z.F. Phillips, M.V. D'Ambrosio, L. Tian, J. Rulison, H.S. Patel, N. Sadras, A. Gande, N. Switz, D.A. Fletcher & L. Waller (13 May 2015). *Multi-Contrast Imaging and Digital Refocusing on a Mobile Microscope with a Domed LED Array*. PLoS ONE 10(5): e0124938. doi: 10.1371/journal.pone.0124938

D.L. Marks, P.R. Llull, **Phillips Z.F.**, *et.al*. (2014). *Characterization of the AWARE 10 two-gigapixel wide-field-of-view visible imager*. Applied Optics 53(14) C54-C63. doi: 10.1364/AO.53.000C54

R.K. Chhetri, **Z.F. Phillips**, M.A. Troester, A.L. Oldenburg (2012). *Longitudinal study of mammary epithelial and fibroblast co-cultures using optical coherence tomography reveals morphological hallmarks of pre-malignancy*. PLoS ONE 7(11) e49148 doi: 10.1371/journal.pone.0049148

Talks

S. Dean, **Z.F. Phillips**, L. Waller and B. Recht (26 June 2018) *Optimal Path and Illumination Design for Multiframe Motion Deblurring* Imaging Systems and Applications 2018 (ITu2B. 4)

M. Kellman, **Z.F. Phillips**, D. Ren, M. Lustig & L. Waller (10 June 2018) *Motion resolved quantitative phase imaging (Conference Presentation* Computational Imaging III 10669, 106690D

Z.F. Phillips, S. Dean, B. Recht, & L. Waller (27 March 2018) *Multi-Frame Motion Imaging For Optical Microscopy* Focus on Microscopy 2018.

Z.F. Phillips, R. Eckert & L. Waller (7 June 2017) *Quasi-Dome: A Self-Calibrated High-NA LED Illuminator for Fourier Ptychography.* OSA Imaging Systems and Applications, Paper IW4E.5.

Z.F. Phillips, M. Chen & L. Waller (7 April 2017) *Quantitative Differential Phase Contrast Imaging with Pupil Recovery.* OSA Bio-Optics, Design and Application, Paper JTu5A.2.

Z.F. Phillips, M. Chen & L. Waller (7 July 2016) *Single-Shot Quantitative Phase and Amplitude Retrieval Using Color-Multiplexed Differential Phase Contrast Microscopy.* OSA Computational Optical Sensing and Imaging, Paper CT1D.4.

Z.F. Phillips, M. Chen & L. Waller (7 April 2016) *Amplitude and Phase Recovery from Motion Blur Deconvolution*. SPIE DCS Computational Imaging, Paper 9870-17.

G. Gunjala, **Z.F. Phillips** & L. Waller (7 April 2016) *Optimal LED illuminator design for Fourier ptychographic microscopy* SPIE DCS Computational Imaging, Paper 9870-13.

Z.F. Phillips, G. Gunjala, P. Varma, J. Zhong & L. Waller (7 June 2015) *Design of a Domed LED Illuminator for High-Angle Computational Illumination*. OSA Imaging Systems, Paper FTu2F.5.

Z.F. Phillips, M.V. D'Ambrosio, L. Tian, J. Rulison, H.S. Patel, N. Sadras, A. Gande, N. Switz, D.A. Fletcher & L. Waller (12 April 2015) *Computational CellScope: Multi-Contrast Imaging on a Smartphone-Based Microscope Using a Domed Programmable LED Array*. OSA Bio-Optics: Design and Application, Paper BM3A.7.

Z.F. Phillips, R.K. Chhetri, J. Cooper, M.A. Troester & A.L. Oldenburg (2 Feb. 2013) *Fractals and fluctuations: spatial and temporal correlations in optical coherence tomography of human breast cancer models*. Dynamics and Fluctuations in Biomedical Photonics X (SPIE Photonics West), Paper 8580-2.

D.L. Marks, J.G. Anderson, **Z.F. Phillips**, S.T. McCain & D.J. Brady (19 oct. 2014) *Gigapixel Whole-Body Microscopy.* Frontiers in Optics, Paper FTu2F.5.

D.L. Marks, **Z.F. Phillips**, S.D. Feller & D.J. Brady (22 June 2014) *Multiscale Camera Objective with sub 2 Arcsec Resolution, 36 degree Field-of-View* Computational Optical Sensing and Imaging, Paper CTh1C.3.