Kristina Monakhova

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Education

University of California, Berkeley *Berkeley, CA*

Ph.D. in Electrical Engineering and Computer Science *2016 - PRESENT*

- Advisor: Prof. Laura Waller

The State University of New York at Buffalo *Buffalo, NY*

BS, Electrical Engineering, Technical GPA: 4.00 / 4.00 *2012 - 2016*

Research Focus

My current research involves combining **computational imaging** with **machine learning** to make small, cheap, cameras for better informed AI. This involves combining optical hardware and algorithm co-design to make novel, application specific cameras and imagers. I am interested in end-to-end optical design, unrolled optimization, compressive sensing, and physics-based learning.

Experience

Berkeley Artificial Intelligence Research (BAIR), Research Assistant in Dr. Laura Waller's group	2017-PRESENT
MIT Lincoln Laboratory, Advanced Sensor Systems and Test Beds Intern	2016
University at Buffalo Nanosatellite Laboratory, undergrad researcher with Dr. Crassidis	2012-2016
Northrop Grumman Electronic Systems, systems engineering intern	2015
Northrop Grumman Aerospace Systems, systems engineering intern	2015
Carnegie Mellon Robotics Institute, RISS REU with Dr. Red Whittaker	2014
NASA Marshall Space Flight Center, NASA Robotics Academy summer researcher	2013

Teaching

Graduate Teaching Assistant, UC Berkeley

EE290T - High dimensional data analysis with low dimensional models Fall 2018

Created jupyter notebook-based programming assignments and interactive lab discussions for new graduate class on compressive sensing and low-rank models. Gave bi-weekly discussion section and taught one lecture.

Academic Honors & Awards

UC Berkeley EECS Excellence Award	2016
National Science Foundation Graduate Research Fellowship (NSF GRFP)	2016
National Defense Science and Engineering Graduate Fellowship (NDSEG), (declined for NSF GRFP)	2016
Barry M. Goldwater Scholarship	2015
USRA John R. Sevier Memorial Scholarship Award	2014
University at Buffalo Honors College Gino Calvi Memorial Scholarship	2014
University at Buffalo Electrical Engineering Chair Award	2014
University at Buffalo Dean's List, all semesters	2012 – 2016
University at Buffalo Presidential Scholarship, four year full-ride scholarship	2012 – 2016

Journal & Conference Publications

1. **Kristina Monakhova**, Joshua Yurtsever, Grace Kuo, Nick Antipa, Kyrollos Yanny, and Laura Waller, "Learned reconstructions for practical mask-based lensless imaging," Opt. Express 27, 28075-28090 (2019) {pdf}

2. **Kristina Monakhova**, Nick Antipa, and Laura Waller, "Learning for lensless mask-based imaging," in Computational Optical Sensing and Imaging, pp. CTu3A–2, Optical Society of America, 2019 {pdf}

Workshops and Poster Presentations

1. **Kristina Monakhova**, Joshua Yurtsever, Grace Kuo, Nick Antipa, Kyrollos Yanny, Laura Waller, "Unrolled, model-based networks for lensless imaging", submitted to 2019 NeurIPS Deep Inverse Workshop (accepted)
2. **Kristina Monakhova**, Nick Antipa, Laura Waller, "Learning reconstructions for lensless imaging", in 2019 Physics in ML Workshop, Berkeley, CA, May. 2019 (poster)
3. **Kristina Monakhova**, Kyrollos Yanny, Fanglin Linda Liu, Evan Shelhamer, Emrah Bostan, Laura Waller, "Deep Diffusers - machine learning for lensless imaging", in 2018 ICCP Conference, Pittsburgh, PA, May. 2018 (poster)
4. Regina Eckert, **Kristina Monakhova**, Zachary F. Philips, Yongbing Zhang, Lei Tian, Laura Waller, "Advances in 3D Fourier Ptychography", in 2017 ICCP Conference, Stanford, CA, May. 2017 (poster)

Talks

Practical mask-based lensless imaging reconstructions based on physics and deep learning fall 2019
Berkeley Center for Computational Imaging Seminar Series

Using physics and deep learning for practical imaging without a lens fall 2019
Berkeley Artificial Intelligence Research Lab Seminar Series

Advising

Undergraduate research

Jonathan Fung (currently at UC Berkeley)	fall 2019 - present
Kristie Diep (currently at UC Berkeley, BioESP REU)	summer 2019
Ellin Zhao (currently at UC Berkeley)	2018-present
Joshua Yurtsever (currently at UC Berkeley)	2018-present
Nico Deshler (currently at UC Berkeley, SUPERB REU)	2018-present

Service & Mentoring

UC Berkeley EECS Peer 2019-present

UC Berkeley Bioengineering Scholars Program (BioESP) Mentor summer 2019
Mentored bioengineering undergraduate researcher throughout summer research program.

UC Berkeley SUPERB REU Mentor summer 2018
Mentored undergraduate researcher during summer REU on a project involving thin, 3D cameras in array geometries. Student was selected to represent UC Berkeley at 2018 REU Symposium.

Electrical Engineering Graduate Student Association 2017-2018
Served as social chair, worked to create inclusive and friendly environment for graduate students.

Women in Computer Science and Electrical Engineering (WICSE) 2017-2018
Organized events to promote diversity and inclusively within the EECS PhD program, including visit day events for female-identifying students, and mentorship program for 1st year PhD students

WICSE 1st year mentoring program 2017, 2019

Berkeley Artificial Intelligence Research Mentoring Program 2018, 2019
Mentored undergraduate student interested in research

Students for the Exploration and Development of Space 2013-2014
Served as board member for a nationwide student-run nonprofit organization interested in promoting space research and outreach. Hosted monthly meetings with student chapters to facilitate technology discussion and collaboration. Founded SpaceTalks, a bimonthly Google Hangout series with space industry leaders for student networking opportunities

Students for the Exploration and Development of Space, Buffalo Chapter Vice President 2013-2014
Ran space-related student activities, helped run meetings, astronomy, and monthly outreach events to the Buffalo Science Museum.

Professional Activities

Paper Reviewing

IEEE Transactions of Computational Imaging 2018, 2019
OSA Continuum 2019

Grants

NASA Undergraduate Student Instrument Project Grant 2016
Writing lead for $100,000 student grant proposal. Grant was awarded and funded the continuation of UB's Nanosatellite Laboratory with a new CubeSat mission to characterize radio noise in orbit with a software defined radio.

Other Honors & Awards

MIT Lincoln Labs Intern Innovation Challenge, 2nd place 2016
University at Buffalo Electrical Engineering Study Abroad Fellowship 2015
MathWorks Student Simulink Competition, 2nd place internationally 2014
NASA Marshall Intern Poster Contest, 1st place 2013
University at Buffalo Elevator Pitch Competition, 1st place 2013
SpaceVision Newspace Student Business Plan Competition, 2nd place 2012