Achuta Kadambi

Assistant Professor
Electrical Engineering
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Scientific Mission

Imaging the invisible by jointly studying optics and computer science.

Education

PhD	MIT Media Lab / EECS	2017
MS	Yale	2012
BS	Berkeley	2011

Appointments

Co-founder, Chief Scientist	Akasha Imaging (http://akasha.im)	2019-
Assistant Professor	UCLA / Electrical Engineering	2018-

Awards

2019 Forbes 30 Under 30, Science
2019 NSF Research Initiation Award (CRII)
2018 Best Paper Award, IEEE ICCP
2016 Lemelson-MIT Student Prize
2016 Rahamimoff Award, US-Israel Science Foundation
2016 Best Papers Special Issue Selection, ICCV
2016 Best Presentation Award, CVPR VIEW workshop
2015 World Changing Idea, Scientific American
2015 Qualcomm Innovation Fellowship
2013 Draper 4-year PhD Fellowship
2011 Regent and Chancellor Scholar, UC Berkeley

Awards won by Students

2019 Best Undergraduate Demo, UCLA ARR (A. Padhye et al)
2019 Best Poster Award, runner up, SoCal Machine Learning Day (Y. Ba et al)

Visiting Positions

2017 Visiting researcher, Harvard Medical School, Boston MA
2016 Visiting student, Technion Electrical Engineering, Israel
2015 Intern, Microsoft Research, Redmond WA
2014 Intern, Mitsubishi Electric Research Lab (MERL), Cambridge MA

Invited Talks

2019 DARPA/MEC workshop on AI, San Jose CA
2019 Stanford EE Department, Stanford CA
2019 Lemelson-MIT EurekaFest!, Cambridge MA
2019 Computational Light Transport Summit, Banff Canada
2019 Machine Learning Summer School (univ.ai), Bangalore India
2019 Honeywell Technology Symposium, Phoenix, AZ
2019 Annual Research Review, UCLA, Los Angeles CA
2018 Carnegie Mellon University, Pittsburgh PA
2018 University of California, Los Angeles CA
2018 Harvard University, Cambridge MA
2018 MIT CSAIL, Cambridge MA
2017 University of Tokyo, Tokyo JP
2017 Cymer Semiconductor Equipment, San Diego CA
2017 Computer Vision and Information Processing Society of Japan, Nagoya JP

2016 Honeywell Technology Symposium, Phoenix, AZ
2016 Columbia CS, New York City, NY
2016 Cornell Tech, CS, New York City, NY
2016 Mitsubishi Electric Research Labs (MERL), Boston MA
2016 University of Pennsylvania GRASP Lab, Philadelphia PA
2016 Princeton CS, Princeton, New Jersey
2016 Weizmann Institute of Science, Rehovat, Israel
2016 Technion CS Dept, Haifa, Israel
2016 Mass General Hospital (MGH), Boston
2016 SIGGRAPH, Anaheim, CA
2016 Computer Vision and Pattern Recognition, Las Vegas, NV
2016 OSA Imaging Systems and Applications, Heidelberg, Germany
2016 Analog Devices, Cambridge MA
2015 Computational Imaging Junior Researcher Summit, Daghstuhl, Germany
2015 Microsoft Research, Redmond, WA
2015 International Conference on Computer Vision, Santiago, Chile
2015 New England Computer Vision Workshop, Amherst MA
2015 SIGGRAPH, Los Angeles, CA
2014 Qualcomm Research, San Diego, CA
2014 Technion Institute of Technology, Haifa, Israel
2014 Microsoft iToF Workshop, Ein Gadi, Israel
2014 Indian Institute of Technology, Bombay, India
2014 SIGGRAPH, Vancouver, Canada
2014 International Conference on Computational Photography, Santa Clara, CA
2013 OSA Computational Optical Sensing and Imaging, Arlington, VA
2013 Nokia Research, Bangalore, India
2013 SIGGRAPH Asia, Hong Kong

Graduate Students Supervised

Pradyumna Chari	PhD	Electrical / Computer Engineering	2019-
Yunhao Ba	PhD	Electrical / Computer Engineering	2019-
Guangyuan Zhao	PhD	Electrical / Computer Engineering	2018-
Weixi Feng	MS	Electrical / Computer Engineering	2019-
Sasha Safonov	MS	Electrical / Computer Engineering	2018-
Prachi Shahi	MS	Electrical / Computer Engineering	2018-

Alumni

Yunhao Ba	MS	Next Position: PhD at UCLA	2018-2019
Bakari Hassan	MS	Next Position: PhD at CMU	2018-2019
Yiqin Wang	MS	Next Position: Micron Technologies	2018-2019

External Funding Sources

NSF	$175,000	CRII Initiation Award	2019-2021
NVIDIA	$3,000	GPU Award	2018

Teaching

T.7 Instructor, ECE.211, “Digital Image Processing”, UCLA Spring ’19.
T.6 Instructor, ECE.239, “Computational Imaging”, UCLA Fall ’18.
T.5 Coinstructor, MAS.S65, “Society of Autonomous Vehicles”, MIT Spring ’18.
T.4 Coinstructor, MAS.132/532, “Mathematical Methods in Imaging”, MIT Spring ’14.
T.3 Coinstructor, ”‘Computational Time of Flight Imaging”’, IEEE ICCV 2015.
T.2 Coinstructor, “Computational 3D Imaging”, ACM SIGGRAPH 2015.
T.1 Coinstructor, “3-D Imaging with Time of Flight Cameras”, ACM SIGGRAPH 2014.
T.0 Teaching assistant for various courses.

Professional Service

Program committee Pacific Graphics 2019
Program committee ICCP 2019
Program committee CVPR 2019
Program committee ICCP 2018
Program committee CVPR 2018
Program committee ICCP 2017
Program committee CVPR 2017
Program committee ICCV PBDL Workshop 2017
Program committee CVPR 2016
Organizer Marvin Minsky Memorial Lecture
Reviewer SIGGRAPH
Reviewer SIGGRAPH Asia
Reviewer ICCV
Reviewer CVPR
Reviewer ECCV
Reviewer ICCP
Reviewer IEEE Transactions on Computational Imaging (TCI)
Reviewer Various OSA journals
University Service UCLA, PhD thesis award committee
University Service MIT, undergrad admissions committee
University Service MIT, laser safety representative
University Service Lemelson-MIT student prize, selection committee
IEEE, ACM, and OSA Member

Textbook

TB.1 *Computational Imaging (235 pages)* Published by **MIT Press**, To appear online in 2019 and in print by 2020. Joint work with A. Bhandari and R. Raskar.

Full Papers

P.15 Y Ba, R Chen, Y Wang, L Yan, B Shi, and **A. Kadambi**. *Physics-based Neural Networks for Shape from Polarization*. arXiv 2019.

P.14 T. Maeda, Y. Wang, R. Raskar, and **A. Kadambi**. *Thermal Non-line-of-sight Imaging*.

IEEE ICCP 2019.

P.13 K. Tanaka, N. Ikeya, T. Takatani, H. Kubo, T. Funatomi, V. Ravi, **A. Kadambi** and Y Mukaigawa. *Time-resolved Far Infrared Light Transport Decomposition for Thermal Photometric Stereo*. Submitted to IEEE Transactions on Computational Imaging 2019

P.11 T. Maeda, **A. Kadambi**, Y. Schechner, and R. Raskar. *Dynamic Heterodyne Interferometry*. IEEE ICCP 2018. **(Best Paper Award)**

P.10 **A. Kadambi**, R. Raskar. *Rethinking Machine Vision Time of Flight with GHz Heterodyning*. IEEE Access 2017

P.9 **A. Kadambi**, J. Schiel, and R. Raskar. *Frequency-domain Time of Flight Cameras for Multi-depth Imaging*. Under revision for IJCV 2018.

P.8 **A. Kadambi**, V. Taamazyan, B. Shi, and R. Raskar. *Depth sensing using geometrically constrained polarization normals*. In IJCV 2017. **(Best Papers Issue)**

P.7 **A. Kadambi**, J. Schiel, and R. Raskar. *Macroscopic Interferometry: Rethinking Depth Estimation with Frequency-Domain Time-of-Flight*. In IEEE CVPR (Oral), 2016. **(3% acceptance rate)**

P.6 **A. Kadambi**, H. Zhao, B. Shi, and R. Raskar. *Occluded Imaging with Time of Flight Sensors*. In ACM Transactions on Graphics (pres SIGGRAPH 2016)

P.5 **A. Kadambi**, V. Taamazyan, B. Shi, and R. Raskar. *Polarized 3D: Enhanced 3D sensing fusing depth and polarization cues.* In IEEE ICCV (Oral), 2015 **(3% acceptance rate)**

P.4 N Naik, **A Kadambi**, C Rhemann, S Izadi, R Raskar, and SB Kang. *A Light Transport Model for Mitigating Multipath Interference in TOF Sensors.* In IEEE CVPR, 2015.

P.3 A. Bhandari, **A. Kadambi**, R. Whyte, C. Barsi, M. Feigin, A. Dorrington, and R. Raskar. *Resolving multi-path interference in time-of-flight imaging via modulation frequency diversity and sparse regularization.* In Optics Letters 2014.

P.2 **A. Kadambi**, A. Bhandari, R Whyte, A Dorrington, and R Raskar. *Demultiplexing Illumination via Low Cost Sensing and Nanosecond Coding.* In IEEE ICCP (Oral), 2014.

P.1 **A. Kadambi**, R. Whyte, A. Bhandari, L. Streeter, C. Barsi, A. Dorrington, and R. Raskar. *Coded time of flight cameras: sparse deconvolution to address multipath interference and recover time profiles.* In ACM Transactions on Graphics (pres SIGGRAPH Asia 2013)

Selected Conference Papers

C.5 **A. Kadambi***, A. Cramer*, D Lanza, R Raskar, and R Gupta. *Computational X-ray Imaging with Document Scanners* OSA COSI, 2018

C.4 **A. Kadambi**, J. Schiel, and R. Raskar. *Macroscopic Interferomery with Electrons rather than Photons*. In OSA IS, 2016.

C.3 **A. Kadambi**, P. Boufounos. *Compressive, Coded Aperture, 3-D LIDAR*. In IEEE ICASSP, 2015.

C.2 A. Bhandari, **A. Kadambi**, and R. Raskar. *Sparse Linear Operator Identification without Sparse Regularization?* In IEEE ICASSP, 2014.

C.1 **A. Kadambi**, H. Ikoma, X. Lin, G. Wetzstein, and R. Raskar. *Subsurface Enhancement through Sparse Representations of Multispectral Direct/Global Decomposition.* In OSA Computational Sensing and Imaging (COSI), 2013.

US Patent Filings (Excludes Provisionals)

US.13 A. Kadambi, T. Maeda, A. Bhandari, B. Heshmat, R. Raskar. *Undisclosed LIDAR technique.* MIT Case #19963T

US.12 A. Kadambi, A. Bhandari, R. Whyte, R. Raskar. *Optical frequency domain illumination multiplexing.* MIT Case #16702T

US.11 A. Kadambi, R. Raskar, A. Pan, R. Gupta. *Methods and Apparatus for X-Ray Imaging from Temporal Measurements.* US Patent App. 15/58,169

US.10 A. Bhandari, C. Barsi, A. Kadambi, R. Raskar. *Methods and Apparatus for FLI with pulsed light.* US Patent App. 15/487,438 **(Granted 2019)**

US.9 A. Kadambi, V. Taamazyan, B. Shi, R. Raskar. *Methods for enhancing 3D maps with polarization.* US Patent App. 14/979,433 **(Granted 2019)**

US.8 A. Bhandari, C. Barsi, A. Kadambi, R. Raskar. *Methods and Apparatus for FLI with modulated light.* US Patent App. 15/487,435 **(Granted 2019)**

US.7 A. Kadambi, J. Schiel, V. Taamazyan, A. Bhandari, R. Raskar. *Macroscopic Interferometry.* US Patent App. 15/431,713 **(Granted 2018)**

US.6 P. Boufounos, A. Kadambi. *Intensity-based Depth Sensing System and Method.* US Patent App. 14/628,360 **(Granted 2018)**

US.5 A. Kadambi, H. Zhao, B. Shi, A. Bhandari, R. Raskar. *Methods and Apparatus for Virtual Sensor Array* US Patent App. 14/795,113 **(Granted 2018)**

US.4 A. Kadambi, R. Whyte, A. Bhandari, L. Streeter, C. Barsi, A. Dorrington, R. Raskar. *Methods and Apparatus for Coded Time-of-Flight Camera.* US Patent App. 14/523,708 **(Granted 2017)**

US.3 P. Boufounos, A. Kadambi. *Depth Sensing Using Optical Pulses and Fixed Coded Aperture.* US Patent App. 14/551,394 **(Granted 2017)**

US.2 A. Kadambi, A. Bhandari, R. Raskar. *Methods and Apparatus for Demultiplexing Illumination.* US Patent App. 14/690,159 **(Granted 2016)**

US.1 R. Raskar, A. Kadambi, A. Bhandari, C. Barsi. *Methods and apparatus for multi-frequency camera.* US Patent App. 14/280,284 **(Granted 2016)**