Achuta Kadambi

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Research

Imaging the invisible by blending optics and computer science, topics usually studied separately. Applications to cyber-physical systems, transportation, and healthcare.

Education

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

Awards

2019 CRII Research Initiation Award, NSF
2019 Forbes 30 Under 30 (Science)
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

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

Keynote/Plenary Talks

2017 Computer Vision and Information Processing Society of Japan, Nagoya JP
2016 Honeywell Technology Symposium, Phoenix, AZ

Invited Talks

2017 University of Tokyo, Tokyo JP
2017 Cymer Semiconductor Equipment, San Diego CA
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

Teaching

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 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 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.11 T. Maeda, A. Kadambi, Y. Schechner, 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, 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, R. Raskar. *Depth sensing using geometrically constrained polarization normals*. In IJCV 2017. **(Best Papers Issue)**

P.7 A. Kadambi, J. Schiel, 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, 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, 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, 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, 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, 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, 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, R Gupta. *Computational X-ray Imaging with Document Scanners* OSA COSI, 2018

C.4 A. Kadambi, J. Schiel, 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, R. Raskar. *Sparse Linear Operator Identification without Sparse Regularization?* In IEEE ICASSP, 2014.

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

US Patent Filings

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

US.11 A. Bhandari, C. Barsi, A. Kadambi, R. Raskar. *Methods and Apparatus for FLI with pulsed light.* US Patent App. 15/487,438

US.10 A. Kadambi, A. Bhandari, R. Whyte, R. Raskar. *Optical frequency domain illumination multiplexing.* MIT Case #16702T

US.8 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.9 A. Kadambi, V. Taamazyan, B. Shi, R. Raskar. *Methods for enhancing 3D maps with polarization.* US Patent App. 14/979,433 (Granted by USPTO in 2019)

US.12 A. Bhandari, C. Barsi, A. Kadambi, R. Raskar. *Methods and Apparatus for FLI with modulated light.* US Patent App. 15/487,435 (Granted by USPTO in 2019)

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

US.6 P. Boufounos, A. Kadambi. *Intensity-based Depth Sensing System and Method.* US Patent App. 14/628,360 (Granted by USPTO in 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 by USPTO in 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 by USPTO in 2017)

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

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