

# Achuta Kadambi

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## Research

Sensing for AI, Computational Imaging, Digital Health, Sustainable Sensing

## Education

PhD	MIT	2018
Visiting PhD student	Technion - Israel Inst. of Technology	2016
MS	Yale	2012
BS	Berkeley	2011

## Academic Appointments

Assistant Professor	UCLA Computer Science	2021-present
Assistant Professor	UCLA Electrical / Computer Engineering	2018-present

## Companies Founded

Co-founder	Vayu Robotics	2022-
Co-founder	Akasha (acquired by Intrinsic/Alphabet)	2018-22

## Awards

2022	<b>IEEE-HKN Outstanding Young Professional Award</b> (1 award/yr, under 35 yrs/age)
2021	<b>NSF CAREER Award</b>
2021	<b>DARPA Young Faculty Award</b>
2021	<b>Army Research Office Young Investigator Award (ARO YIP)</b>
2021	National Academy of Engineering (NAE) Frontiers of Engineering
2020	Google Faculty Award
2020	Senior Member National Academy of Inventors
2019	<b>Forbes 30 under 30, Science</b>
2019	NSF CRII Research Initiation Award
2019	Sony Imaging Young Faculty Award
2018	Best Paper Award, 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
2015	World Changing Idea, Scientific American
2014	Qualcomm Innovation Fellowship
2013	Draper Fellowship
2011	Regent and Chancellor Scholar, UC Berkeley

## Awards won by Students

2022	NSF Graduate Research Fellowship GRFP (E. Zhao)
2021	Cisco PhD Fellowship (P. Chari)
2020	Guru Krupa Graduate Fellowship, UCLA (C. Talegaonkar)
2019	Best Undergraduate Demo, Annual Research Review (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 (host: Prof. Rajiv Gupta)
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- 2016 Visiting PhD Student, Technion, Israel (host: Prof. Yoav Y. Schechner)
- 2015 Intern, Microsoft Research, Redmond WA
- 2014 Intern, Mitsubishi Electric Research Labs (MERL), Cambridge MA

## Invited Talks

- 2022 **Keynote**, CVPR UG2 Workshop (New Orleans, LA)
- 2022 **Keynote**, CVPR CVPM Workshop (New Orleans, LA)
- 2022 CMU Bioengineering Department Seminar (Pittsburgh, PA)
- 2022 Optical Sensors and Sensing Congress (Vancouver, CA)
- 2021 MIT AeroAstro Department (Cambridge, MA)
- 2021 Boston University Electrical Engineering Department (Boston, MA)
- 2021 EPFL, Lausanne Switzerland (Rescheduled - COVID)
- 2021 UCLA School of Medicine Grand Rounds, Los Angeles CA (Los Angeles, CA)
- 2021 Snap Inc. (Virtual)
- 2021 Cornell AI in Medicine Seminar (Virtual)
- 2021 ETH Zurich Computer Vision Seminar (Zurich, Switzerland)
- 2021 Amazon + UCLA Science Hub Kickoff Event (Los Angeles, CA)
- 2021 Pixel Cafe at UCSD (Virtual)
- 2021 UC Berkeley Bioengineering, Guest Lecturer for Medical Device Design (Virtual)
- 2021 Black in Neuro Panel, Imperial College London (Virtual)
- 2021 Army Research Lab A2I2 Summit (Virtual)
- 2021 ICCV GigaVision Workshop (Virtual)
- 2021 CLEO Panel on AI and Photonics (Virtual)
- 2021 Army Research Lab Workshop on Synthetic Data (Virtual)
- 2020 SPIE Workshop on Computational Imaging (Virtual)
- 2020 Army Research Lab, Adelphi MD
- 2020 CVPR Visual Physics, Seattle WA
- 2019 DARPA/MEC workshop on AI, San Jose CA
- 2019 Stanford EE Department, Stanford CA
- 2019 MIT Media Lab, Cambridge MA
- 2019 Lemelson-MIT EurekaFest, Cambridge MA
- 2019 Computational Light Transport Summit, Banff Canada
- 2019 Indian Institute of Science, EE Department, Bangalore India
- 2019 Machine Learning Summer School, Bangalore India
- 2019 Honeywell Technology Symposium, Phoenix AZ
- 2019 Annual Research Review, UCLA, Los Angeles CA
- 2018 University of California, Los Angeles CA
- 2018 Carnegie Mellon University, Pittsburgh PA
- 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 Lab (MERL), Boston MA

2016 University of Pennsylvania GRASP Lab, Philadelphia PA  
2016 Princeton CS, Princeton, New Jersey  
2016 Weizmann Institute of Science, Rehovot Israel  
2016 Technion CS Department, Haifa Israel  
2016 Mass General Hospital (MGH), Boston MA  
2016 OSA Invited Talk, Heidelberg Germany  
2016 Analog Devices, Cambridge MA  
2015 Computational Imaging Summit, Dagstuhl Germany  
2015 Microsoft Research, Redmond WA  
2014 Qualcomm Research, San Diego CA  
2014 Technion, Haifa Israel  
2014 Microsoft iToF Workshop, Ein Gadi Israel  
2014 IIT-Bombay, Bombay India  
2013 Nokia Research, Bangalore India

## Professional Service

Guest Editor, Applied Sciences, Special Issue on Computational Photography  
Program chair, CVPR CCD 2021  
Program chair, CVPR CCD 2020  
Program chair, Industry relations, ICCP 2020  
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  
Reviewer, SIGGRAPH  
Reviewer, SIGGRAPH Asia  
Reviewer, ICCV  
Reviewer, CVPR  
Reviewer, ECCV  
Reviewer, ICCP  
Reviewer, IEEE Trans Comp Imaging (TCI)  
Reviewer, Various OSA journals  
University Service, UCLA, MS admissions committee  
University Service, UCLA, PhD thesis award committee  
University Service, MIT, undergrad admissions committee  
University Service, Lemelson-MIT student prize selection committee  
IEEE, ACM, and OSA member

## Textbook

- TB.1 A. Bhandari, **A. Kadambi**, R. Raskar, *Computational Imaging* (450 pages). **MIT Press**, 2022 (E-PDF at [imagingtext.github.io](https://imagingtext.github.io))

## Papers

- P.26 P. Chari, S. Athreya, Y. Ba, and **A. Kadambi**. *MIME: Minority Inclusion for Majority Group Enhancement of AI Performance*. **ECCV 2022**
- P.25 Y. Ba, H. Zhang, E. Yang, A. Suzuki, A. Pfahnl, C. Chandrappa, C. De Melo, S. You, S. Soatto, A. Wong, and **A. Kadambi**. *Not Just Streaks: Towards Ground Truth for Single Image Deraining*. **ECCV 2022**
- P.24 Y. Ba\*, Z. Wang\*, D. Karinca, O. Bozkurt, and **A. Kadambi**. *Style Transfer with Bio-realistic Appearance Manipulation for Skin-tone Inclusive Plethysmography* **ICCP 2022**
- P.23 A. Vilesov\*, P. Chari\*, A. Armouti\*, A. B. Harish, K. Kulkarni, A. Deoghare, L. Jalilian, and **A. Kadambi**. *Blending Camera and 77 GHz Radar Sensing for Equitable, Robust Plethysmography*. **SIGGRAPH 2022**
- P.22 Z. Wang, Y. Ba, P. Chari, O. Bozkurt, G. Brown, P. Patwa, N. Vaddi, L. Jalilian, and **A. Kadambi**. *Synthetic Generation of Face Videos with Plethysmograph Physiology*. **CVPR 2022**
- P.21 S. Pei, P. Chari, X. Wang, X. Yang, **A. Kadambi**, and Y. Zhang. *ForceSight: Non-Contact Force Sensing with Laser Speckle Imaging*. **UIST 2022**
- P.20 **A. Kadambi**, *Achieving Fairness in Medical Devices*. **Science** 2021 no. 372.6537
- P.19 A. Kalra, B. Brown, G Stoppi, R. Agrawal, and **A. Kadambi**. *Towards Rotation Invariance in Object Detection*. **ICCV 2021**.
- P.18 **A. Kadambi** and A. Madni, *Artificial Intelligence: From Ancient Greeks to Self-Driving Cars and Beyond*, **Nat'l Academy of Engineering Bridge** 2021
- P.17 Y. Ba, A. Gilbert, F. Wang, J. Yang, R. Chen, Y. Wang, B. Shi and **A. Kadambi**. *Deep Shape from Polarization*. **ECCV 2020**.
- P.16 K. Tanaka, Y. Mukaigawa, and **A. Kadambi**. *Polarized Non-line-of-sight Imaging*. **CVPR 2020**
- P.15 A. Kalra, V. Taamazyan, S. Rao, K. Venkataraman, R Raskar, and **A. Kadambi**. *Deep Polarization Cues for Transparent Object Segmentation*. **CVPR 2020 (Top 3% paper)**

- P.14 P. Chari, C. Talegaonkar, Y. Ba, and **A. Kadambi**. *Visual Physics: Discovering Physical Laws from Video*. arXiv:1911.11893, 2019
- P.13 Y. Ba, G. Zhao, and **A. Kadambi**. *Blending Diverse Physical Priors with Neural Networks*. arXiv:1910.00201, 2019
- P.12 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*. IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), 2020
- P.11 T. Maeda, Y. Wang, R. Raskar, and **A. Kadambi**. *Thermal Non-line-of-sight Imaging*. IEEE **ICCP** 2019
- P.10 T. Maeda, **A. Kadambi**, Y. Schechner, and R. Raskar. *Dynamic heterodyne interferometry*. IEEE **ICCP** 2018 (**Best Paper Award**)
- P.9 **A. Kadambi** and R. Raskar. *Rethinking Machine Vision Time of Flight with GHz Heterodyning*. IEEE **Access** 2017
- 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*. IEEE **CVPR** 2016 (**Oral, 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*. **ICCV** 2015 (**Oral, 3% acceptance rate**)
- P.4 N. Naik, **A. Kadambi**, C. Rhemann, S. Izadi, R. Raskar and S. Kang. *A light transport model for mitigating multipath interference in ToF sensors*. In **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*. **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*. **ICCP** 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. ACM Transactions on Graphics (pres SIGGRAPH Asia 2013).*

## Patents

- US.19 *Systems and methods for transparent object segmentation using polarization cues. US Patent 11,302,012*
- US.18 *Systems and methods for pose detection and measurement US Patent 11,295,475*
- US.17 *Systems and methods for camera exposure control. US Patent 11,290,658*
- US.16 *Systems and methods for surface modeling using polarization cues. US Patent 11,270,110*
- US.15 *Systems and methods for characterizing object pose detection and measurement systems. US Patent 11,195,303*
- US.14 *Methods and apparatus for gigahertz time-of-flight imaging. US Patent 11,181,623*
- US.13 *Depth maps with polarization cues. US Patent 10,557,705*
- US.12 *X-ray imaging from temporal measurements. US Patent 10,527,562*
- US.11 *Time-of-flight sensor. US Patent 10,488,520*
- US.10 *Fluorescent lifetime with periodically modulated light. US Patent 10,337,993*
- US.9 *Depth maps with polarization cues. US Patent 10,260,866*
- US.8 *Methods and apparatus for time-of-flight imaging. US Patent 10,191,154*
- US.7 *Fluorescence lifetime imaging with pulsed light. US Patent 10,190,983*
- US.6 *Methods and apparatus for virtual sensor array. US Patent 9,897,699*
- US.5 *Intensity-based depth sensing system and method. US Patent 9,897,698*
- US.4 *Methods and apparatus for coded time-of-flight camera. US Patent 9,778,363*
- US.3 *Depth sensing using optical pulses and fixed coded aperture. US Patent 9,638,801*
- US.2 *Methods and apparatus for demultiplexing illumination. US Patent 9,451,141*
- US.1 *Methods and apparatus for multi-frequency camera. US Patent 9,405,008*