

# Achuta Kadambi

Associate Professor  
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**Bio:** Achuta Kadambi (PhD, MIT '18) is an Associate Professor at UCLA in Electrical Engineering and Computer Science. He leads a research group at the intersection of computer vision, physics, computational imaging, AI, and medical devices. He is the recipient of early career awards including from NSF (CAREER), DARPA (YFA), ARO (YIP), IEEE (HKN under 35 award), and Forbes (30 under 30). He has co-founded two California companies to commercialize research technologies. One, Akasha Imaging, was acquired by Alphabet for its robot automation technology. The other is Vayu Robotics, working on perception-driven robot navigation. Kadambi has filed over 70 patents, 30+ of which have been issued to date.

## Education

PhD	MIT <sup>1</sup>	2018
MS	Yale	2012
BS	Berkeley	2011

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<sup>1</sup> Interdepartmental Doctoral Degree Program between the MIT Media Lab and MIT EECS

## Academic Appointments

Assoc. Prof.	UCLA (Elec. Engr. & Comp Sci.)	2024-
Asst. Prof.	UCLA (Comp. Sci.)	2021-2024
Asst. Prof.	UCLA (Elec. & Comp. Engr.)	2018-2024

## Start-up Companies Founded

Co-founder	Akasha Imaging (acquired by Alphabet)	2018-2022
Co-founder	Vayu (backed by Khosla Ventures)	2022-pres

## Awards

2024	Senior Member, IEEE	UCLA
2022	IEEE-HKN Outstanding Young Professional under 35 Award	UCLA
2022	Best Demo Award, Honorable Mention, UIST	UCLA
2021	NSF CAREER Award	UCLA
2021	DARPA Young Faculty Award	UCLA
2021	Army Research Office Young Investigator Award (ARO YIP)	UCLA
2021	National Academy of Engineering (NAE) Frontiers of Engineering	UCLA
2020	Google Faculty Award	UCLA
2020	Senior Member National Academy of Inventors	UCLA
2019	Forbes 30 under 30, Science	UCLA
2019	NSF CRII Research Initiation Award	UCLA
2019	Sony Imaging Young Faculty Award	MIT
2018	Best Paper Award, ICCP	MIT
2016	Lemelson-MIT Student Prize	MIT
2016	Rahamimoff Award, US-Israel Science Foundation	MIT
2016	Best Papers Special Issue Selection, ICCV	MIT
2016	Best Presentation Award, CVPR VIEW	MIT
2015	World Changing Idea, Scientific American	MIT
2014	Qualcomm Innovation Fellowship	MIT
2013	Draper Fellowship	MIT

## Awards won by UCLA Students

2023	Distinguished Master's Thesis Award, ECE Department (Adnan Armouti)
2022	NSF Graduate Research Fellowship GRFP, Winner (Ellin Zhao)
2022	NSF Graduate Research Fellowship GRFP, Hon. Mention (Sasha Vilesov)
2021	Cisco PhD Fellowship (Pradyumna Chari)
2020	Guru Krupa Graduate Fellowship, UCLA (Chinmay Talegaonkar)
2019	Best Undergrad Demo, Annual Research Review (A Padhye, A Tilaye, et al)
2019	Best Poster, runner up, SoCal Machine Learning Day (Yunhao Ba)

## Invited Talks

2024 Invited Speaker, DARPA Triage Challenge (DTC) Meeting  
2024 **Keynote**, CVPR 2024, UG2 Workshop (Seattle WA)  
2024 Invited Speaker, Army Research Lab (Playa Vista CA)  
2023 Lecturer, SIGGRAPH 2023, Course on Polarization (Los Angeles CA)  
2023 Lecturer, CVPR 2023, Tutorial on Polarization (Vancouver Canada)  
2023 Invited Speaker, SID Display Conference (Los Angeles CA)  
2023 UC Davis, Bioengineering Seminar (Davis, CA)  
2022 **Keynote**, CVPR UG2 Workshop (New Orleans, LA)  
2022 **Keynote**, CVPR CVPM Workshop (New Orleans, LA)  
2022 University of Maryland, Computer Science (Wash. DC)  
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 Medical School 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 Devices (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

Industry Chair, ICCP 2020, ICCP 2022, ICCP 2023  
Invited Guest Editor, Applied Sciences, Special Issue, 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, CVPR 2018, 2019, 2020, 2021  
Program committee, ICCP 2018, 2019, 2020, 2021, 2022, 2023  
Program committee, ICCV PBDL Workshop 2017  
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 ECE TA Awards Committee 2023  
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  
Co-instructor, "Polarization-based Visual Computing", SIGGRAPH 2023  
Co-instructor, "Polarization-Based Computer Vision", CVPR 2023

## 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 Published

<https://scholar.google.com/citations?user=UMzWJikAAAAJ&hl=en&oi=ao>

- P.33 Zhou, S., Chang, H., Jiang, S., Fan, Z., Zhu, Z., Xu, D., Chari, P., You, S., Wang, Z. and **Kadambi, A.** *Feature 3dgs: Supercharging 3d gaussian splatting to enable distilled feature fields*. **CVPR 2024 (Highlight Paper)**
- P.32 R. Upadhyay, H. Zhang, Y. Ba, E. Yang, B. Gella, S. Jiang, A. Wong, and **A. Kadambi**. *Enhancing Diffusion Models with 3D Perspective Geometry Constraints*. **ACM SIGGRAPH Asia 2023** (journal)
- P.31 Z. Wang, S. Zhou, J. Park, D. Paschalidou, S. You, G. Wetzstein, L. Guibas, and **A. Kadambi**. *ALTO: Alternating Latent Topologies for Implicit 3D Reconstruction*. **CVPR 2023**
- P.30 H. Zhang, Y. Ba, E. Yang, V. Mehra, B. Gella, A. Suzuki, A. Pfahnl, C. Chandrappa, A. Wong, and **A. Kadambi**. *WeatherStream: Light Transport Automation of Single Image Deweathering*. **CVPR 2023**
- P.29 A. Singh, Y. Ba, A. Sarker, H. Zhang, **A. Kadambi**, S. Soatto, M. Srivastava, A. Wong. *Depth Estimation from Camera Image and mmWave Radar Point Cloud*. **CVPR 2023**
- P.28 H. Peters, Y. Ba, and **A. Kadambi**. *pCON: Polarimetric Coordinate Networks for Neural Scene Representations*. **CVPR 2023**
- P.27 A. Kadambi, C. de Melo, C. Hsieh, M. Srivastava, S. Soatto. *Incorporating physics into data-driven computer vision*. **Nature Machine Intelligence 2023**. <https://doi.org/10.1038/s42256-023-00662-0>
- P.26 P. Chari, Y. Ba, S. Zhou, C. Talegaonkar, S. Athreya, and **A. Kadambi**. "On Learning Mechanical Laws of Motion From Video Using Neural Networks." **IEEE Access 11 (2023): 30129-30145**.
- P.25 P. Chari, Y. Ba, S. Athreya, and **A. Kadambi**. *MIME: Minority Inclusion for Majority Group Enhancement of AI Performance*. **ECCV 2022**
- P.24 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.23 Y. Ba\*, Z. Wang\*, D. Karınca, O. Bozkurt, and **A. Kadambi**. *Style Transfer*

*with Bio-realistic Appearance Manipulation for Skin-tone Inclusive Plethysmography* **ICCP 2022**

- P.22 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** (journal)
- P.21 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.20 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.19 B. Jalali, Y. Zhou, A. Kadambi, and V. Roychowdhury. *Physics-AI Symbiosis*. **ML Science and Technology 2022**
- P.18 **A. Kadambi**, *Achieving Fairness in Medical Devices*. **Science** 2021 no. 372.6537
- P.17 A. Kalra, B. Brown, G Stoppi, R. Agrawal, and **A. Kadambi**. *Towards Rotation Invariance in Object Detection*. **ICCV 2021**.
- P.16 **A. Kadambi** and A. Madni, *Artificial Intelligence: From Ancient Greeks to Self-Driving Cars and Beyond*, **Nat'l Academy of Engineering Bridge 2021**
- P.15 Y. Ba, A. Gilbert, F. Wang, J. Yang, R. Chen, Y. Wang, B. Shi and **A. Kadambi**. *Deep Shape from Polarization*. **ECCV 2020**.
- P.14 K. Tanaka, Y. Mukaigawa, and **A. Kadambi**. *Polarized Non-line-of-sight Imaging*. **CVPR 2020**
- P.13 A. Kalra, V. Taamazyan, S. Rao, K. Venkataraman, R Raskar, and **A. Kadambi**. *Deep Polarization Cues for Transparent Object Segmentation*. **CVPR 2020 (Oral)**
- 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)**
- 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**).

## US Patents

- US.31 *Systems and methods for high dynamic range image reconstruction*. **US Patent #12,020,455** (publication date: 2024-06-25)
- US.30 *Systems and methods for pose detection and measurement*. **US Patent #12,008,796** (publication date: 2024-06-11)
- US.29 *In-hand pose refinement for pick and place automation*. **US Patent #11,986,955** (publication date: 2024-05-21)
- US.28 *Systems and methods for augmentation of sensor systems and imaging systems with polarization (continuation)* **US Patent #11,982,775** (publication date: 2024-05-14)

- US.27 *Multi-aperture polarization optical systems using beam splitters* **US Patent #11,953,700** (publication date: 2024-04-09)
- US.26 *Systems and methods for six-degree of freedom pose estimation of deformable objects* **US Patent #11,954,886** (publication date: 2024-04-09)
- US.25 *Systems and methods for transparent object segmentation using polarization cues (continuation)* **US Patent #11,842,495** (publication date: 2023-12-12)
- US.24 *Systems and methods for synthesizing data for training statistical models on different imaging modalities including polarized images.* **US Patent #11,797,863** (publication date: 2023-10-24)
- US.23 *Systems and methods for surface modeling using polarization cues (continuation).* **US Patent #11,699,273** (publication date: 2023-07-11)
- US.22 *Systems and methods for high dynamic range imaging using crossed polarizers.* **US Patent #11,689,813**
- US.21 *Systems and methods for camera exposure control.* **US Patent #11,683,594**
- US.20 *Systems and methods for augmentation of sensor systems and imaging systems with polarization.* **US Patent #11,525,906**
- 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**