

Akshat Dave

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Current Appointment

Massachusetts Institute of Technology
Postdoctoral Associate, MIT Media Lab
Advisor: Ramesh Raskar

Cambridge, MA
2023 - Present

Education

Rice University
Ph.D. in Computer and Electrical Engineering
Advisor: Ashok Veeraraghavan

Houston, TX
2017 - 2023

Indian Institute of Technology Madras
M.Tech. and B.Tech. in Electrical Engineering
Advisor: Kaushik Mitra

Chennai, India
2012 - 2017

Honors and Awards

Ralph Budd Award for the best engineering Ph.D. thesis at Rice University.	2024
INK Fellowship recognizing young achievers redefining their fields.	2024
SIGGRAPH Asia Doctoral Consortium for PhD thesis research.	2023
Lodieska Stockbridge Vaughn Fellowship for outstanding graduate research.	2023
Rice D2K Research Mentoring Fellowship for applied data science innovation.	2022
Best Student Paper Prize at the OSA Imaging and Applied Optics Congress.	2020
Texas Instruments Fellowship for Ph.D. thesis research.	2017
Qualcomm Innovation Fellowship for Masters thesis research.	2016
Svaagata Erasmus Mundus Scholarship for semester exchange in Stockholm.	2015
KVPY National Fellowship for research by the Government of India.	2011

Other Research Experience

Massachusetts Institute of Technology
Visiting Student, MIT Media Lab
Advisor: Ramesh Raskar

Cambridge, MA
2022

Adobe Research
Research Intern
Manager: Kalyan Sunkavalli Mentor: Yannick Hold-Geoffroy

San Jose, CA
2020

Preprints

* means equal contribution

- NeST: Neural Stress Tensor Tomography by leveraging 3D Photoelasticity** 2024
A. Dave, T. Zhang*, A. Young*, R. Raskar, W. Heidrich, A. Veeraraghavan
- Event Cameras Meet SPADs for High-Speed, Low-Bandwidth Imaging** 2024
M. Muglikar, S. Somasundaram, A. Dave, E. Charbon, R. Raskar, D. Scaramuzza

Publications

* means equal contribution

- Handheld Mapping of Specular Surfaces using Consumer-Grade Flash LiDAR** ICCP 2024
T. Lin, C. Henley, S. Somasundaram, A. Dave, M. Laifenfeld, R. Raskar
IEEE International Conference on Computational Photography 2024
- DecentNeRFs: Decentralized Neural Radiance Fields from Crowdsourced Images** ECCV 2024
Z. Tasneem, A. Dave, A. Singh, K. Tiwary, P. Vepakomma, A. Veeraraghavan, R. Raskar
European Conference on Computer Vision 2024
- SUNDIAL: 3D Satellite Understanding through Direct Ambient and Complex Lighting Decomposition** CVPRW 2024
N. Behari, A. Dave, K. Tiwary, W. Yang, R. Raskar
Earthvision CVPR Workshop 2024
- First-Arrival Differential Counting for SPAD Array Design** Sensors 2023
M. White, T. Zhang, A. Dave, S. Ghajari, A. C. Molnar, A. Veeraraghavan
MDPI Sensors Special Issue 2023
- ORCa: Glossy Objects as Radiance Field Cameras** CVPR 2023
K. Tiwary*, A. Dave*, N. Behari, T. Klinghoffer, A. Veeraraghavan, R. Raskar
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023
- Role of Transients in Two-Bounce Non-Line-of-Sight Imaging** CVPR 2023
S. Somasundaram, A. Dave, C. Henley, A. Veeraraghavan, R. Raskar
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023
- PANDORA: Polarization-Aided Neural Decomposition Of Radiance** ECCV 2022
A. Dave, Y. Zhao, A. Veeraraghavan
European Conference on Computer Vision 2022
- Snapshot polarimetric diffuse-specular separation** OE 2022
A. Dave, Y. Hold-Geoffroy, M. Hašan, K. Sunkavalli, A. Veeraraghavan
OSA Optics Express 2022
- First Arrival Differential LiDAR** ICCP 2022
Tianyi Zhang, Mel White*, A. Dave*, S. Ghajari, A. Raghuram, A. Molnar, A. Veeraraghavan
International Conference on Computational Photography 2022

A Differential SPAD Array Architecture in 0.18 um CMOS for HDR Imaging M. White, S. Ghajari, Tianyi Zhang, A. Dave , A. Veeraraghavan, A. Molnar <i>International Symposium on Circuits and Systems 2022</i>	ISCS 2022
A Deep Network-based Image Processing Framework for Thermal Images V. Saragadam, A. Dave , A. Veeraraghavan, R. Baraniuk <i>Learning for Computational Imaging Workshop at ICCV 2021</i>	ICCVW 2021
Foveated Non Line of Sight Imaging A. Dave , M. Balaji, P. Rangarajan, A. Veeraraghavan, M. Christensen <i>OSA Imaging and Applied Optics Congress 2020</i>	COSI 2020
Convolutional Approximations to the General NLOS Imaging Operator B. Ahn, A. Dave , A. Veeraraghavan, I. Gkioulekas, A. C. Sankaranarayanan <i>International Conference of Computer Vision 2019</i>	ICCV 2019
SNLOS: Non-line-of-sight Scanning through Temporal Focusing A. Pediredla*, A. Dave* , A. Veeraraghavan <i>International Conference on Computational Photography 2019</i>	ICCP 2019
Solving Inverse Computational Imaging Problems Using Deep Pixel-Level Prior A. Dave , A. K. Vadathya, R. Subramanyam, R. Baburajan, K. Mitra <i>IEEE Transactions on Computational Imaging 2018</i>	TCI 2018
SILC: Smoother Imitation with Lipschitz Costs S. Chaudhary*, A. Dave* , B. Ravindran <i>Workshop on Goal Specification in Reinforcement Learning at ICML 2018</i>	ICMLW 2018
Compressive Image Recovery Using Recurrent Generative Model A. Dave , A. K. Vadathya, K. Mitra <i>IEEE International Conference on Image Processing 2017</i>	ICIP 2017
IITMSAT Communications System - A LeanSat Design Approach A. Gulati, S. Chavan, A. Dave , et al. <i>IAA Conference on University Satellites Missions and CubeSat Workshop 2015</i>	USMCW 2015

Theses

Seeing the Invisible: Next-generation vision systems leveraging polarization and time-of-flight of light <i>Ph.D Thesis, Rice University</i> Ralph Budd Research Award	2023
Deep Learning for Inverse Computational Imaging Problems <i>Masters Thesis, Indian Institute of Technology Madras</i> Qualcomm Innovation Fellowship	2017

Grants

Generative Cameras: Automated Camera Design for Next-generation XR by Leveraging AI as a Scientist	2024
<i>Samsung Research America, \$150,000</i>	
Role: Co-investigator	
Distributed and Private ML for Automotive Datasets	2024
<i>Hyundai America Technical Center, \$250,000</i>	
Role: Co-investigator	
A Roadmap for Generative Design of Visual Intelligence	2024
<i>An MIT Exploration of Generative AI, Seed Grant, \$70,000</i>	
Role: Co-investigator	

Mentorship

Graduate Research Mentor

<i>Hank Lin, MIT</i>	ICCP 2024
<i>Zaid Tasneem, Rice</i>	ECCV 2024
<i>Siddharth Somasundaram, MIT</i>	CVPR 2023
<i>Kushagra Tiwary, MIT</i>	CVPR 2023
<i>Tianyi Zhang, Rice</i>	ICCP 2022

Undergraduate Research Mentor

<i>Nikhil Behari, Harvard</i>	CVPRW 2024
<i>Evelyn Zhu, MIT</i>	2024
<i>Chaitanya Kapoor, BITS Pilani</i>	2024
<i>Abbas Shaikh, Rice</i>	2023

Research Mentoring Fellow

<i>Abdullah Zaher, Bridget Lee, Harry Golen, Natan Rivera</i>	2023
Rice D2K Lab Capstone Program with Houston Fire Department	

Teaching

Instructor

<i>Polarization-based Visual Computing, SIGGRAPH Course</i>	2023
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Teaching Assistant

<i>Introduction to Computer Vision, Rice University</i>	2020
<i>Computational Imaging, Rice University</i>	2019
<i>Fundamentals of Electrical Engineering, Rice University</i>	2018
<i>Machine Learning for Computer Vision, IIT Madras</i>	2016
<i>Data Structures and Algorithms, IIT Madras</i>	2016

Invited Talks

Computer Graphics Seminar , POSTECH South Korea Host: Seung-Hwan Baek	Jul 2024
Invited Talk , CVPR CCD Workshop Hosts: Salman Asif, Yi Xue, Mark Sheinin, Kristina Monakhova	Jun 2024
Invited Talk , Janelia Computational Optics Conference Hosts: Srini Turaga, Hari Shroff, Ruth Sims, Laura Waller	May 2024
Invited Talk , Meta Polarization Workshop Host: Onur Akkaya	Feb 2024
Doctoral Consortium Talk , SIGGRAPH Asia Hosts: Aaron Quigley, Mashhuda Glencross, Simon See	Dec 2023
ECE Group Talk , University of Washington Seattle Host: Arka Majumdar	Aug 2023
Grundfest Lecture Series , University of California Los Angeles Host: Achuta Kadambi	Apr 2023
PixelCafe Seminars , University of California San Diego Host: Manmohan Chandraker	Feb 2023
Computational Imaging Group Talk , Stanford University Host: Gordon Wetzstein	Jan 2023
Computer Graphics Group Talk , Massachusetts Institute of Technology Host: Fredo Durand	Sep 2022
Graphics Talk , Carnegie Mellon University Host: Ioannis Gkioulekas	Aug 2022
Computational Imaging Group Talk , University of Maryland College Park Host: Chris Metzler	Apr 2022

Professional Service

Publications Chair

IEEE ICCP 2024

Organizer

Workshop on Neural Fields Beyond Conventional Cameras, ECCV 2024

Workshop on Extreme Sensing, MIT Media Lab Fall Meeting 2023 and 2024

Conference Reviewer

SIGGRAPH

SIGGRAPH Asia

ICCP

CVPR

ECCV

IROS

Journal Reviewer

ACM TOG

IEEE TPAMI

IEEE TCI

IEEE Signal Processing Letters

OSA Applied Optics

OSA JOSA

Patent Applications

Generating physically-based material maps

A. Dave, K. Sunkavalli, Y. Hold-Geoffroy, M. Hasan

2022

US Patent App. 17/233,861, 2022

Media Coverage and Outreach

Superhuman Vision: AI sees what you can't

2024

TEDxBoston Talk, 'Quin House Boston

ORCa: Glossy Objects as Radiance Field Cameras

2023

MIT Front Page Spotlight. Featured in SciTechDaily, MarkTechPost and more.