

Akshat Dave

NCS 153, New Computer Science, Engineering Dr, Stony Brook, NY 11794

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Research Goals

I focus on creating artificial **vision systems** that overcome the *limitations of the human eye* by integrating **computational cameras**, **differentiable simulations**, and **physics-based machine learning** algorithms.

Academic Appointments

Stony Brook University <i>Assistant Professor, Computer Science</i> PI, Photon Intelligence Lab	Stony Brook, NY 2025 - Present
Massachusetts Institute of Technology <i>Postdoctoral Associate, MIT Media Lab</i> Advisor: Ramesh Raskar	Cambridge, MA 2023 - 2025

Education

Rice University <i>Ph.D. in Electrical and Computer Engineering</i> Advisor: Ashok Veeraraghavan	Houston, TX 2017 - 2023
Indian Institute of Technology Madras <i>M.Tech. and B.Tech. in Electrical Engineering</i> Advisor: Kaushik Mitra	Chennai, India 2012 - 2017

Honors and Awards

Outstanding Reviewer for IEEE CVPR 2025.	2025
Ralph Budd Award for the best engineering Ph.D. thesis at Rice University.	2024
INK Fellowship recognizing young achievers redefining their fields.	2024
ACM 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.	2023
Best Student Paper Prize at the Optica 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

Publications Summary

24 peer-reviewed publications across computer vision (CVPR, ICCV, ECCV), computer graphics (TOG), and optics/imaging (Optics Express, ICCP, TCI) venues—including **9** first-author papers (1 best paper prize) and **10** papers (2 under review) with my advised mentees as first authors.

Grants

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

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 → MIT</i>	CVPRW 2024
<i>Chaitanya Kapoor, BITS Pilani → UCSD</i>	2024
<i>Evelyn Zhu, MIT</i>	2024
<i>Abbas Shaikh, Rice</i>	2023

Research Mentoring Fellow

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

Instructor

<i>CSE590-02 Computational Photography, Stony Brook University</i>	2025
<i>Polarization-based Visual Computing, SIGGRAPH Course</i>	2023

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

Theses

Seeing the Invisible: Next-generation vision systems leveraging polarization and time-of-flight of light (Ralph Budd Thesis Award) <i>Ph.D Thesis, Rice University</i>	2023
Compressive and Coded Image Recovery using Deep Recurrent Priors (Qualcomm Innovation Fellowship) <i>Masters Thesis, Indian Institute of Technology Madras</i>	2017

Preprints

* indicates equal contribution and † indicates advised student

- What if Eye...? Computationally Recreating Vision Evolution** 2025
K. Tiwary[†], A. Young, Z. Tasneem, T. Klinghoffer, **A. Dave**, T. Poggio, D. Nilsson, B. Cheung, R. Raskar
- Task-Driven Implicit Representations for Automated Design of LiDAR Systems** 2025
N. Behari[†], A. Young, **A. Dave**^{*}, R. Raskar^{*}
- TranSplat: Lighting-Consistent Cross-Scene Object Transfer with 3D Gaussian Splatting** 2025
T. Yu, Y. Jin, A. Veeraraghavan, **A. Dave**, G. Balakrishnan

Publications

* indicates equal contribution and † indicates advised student

- Event Cameras Meet SPADs for High-Speed, Low-Bandwidth Imaging** TPAMI 2025
M. Muglikar[†], S. Somasundaram, **A. Dave**, E. Charbon, R. Raskar, D. Scaramuzza
IEEE Transactions on Pattern Analysis and Machine Intelligence
- NeST: Neural Stress Tensor Tomography by leveraging 3D Photoelasticity (ACM Showcase)** TOG 2025
A. Dave, T. Zhang^{*}, A. Young^{*}, R. Raskar, W. Heidrich, A. Veeraraghavan
ACM Transactions on Graphics
- Enhancing Autonomous Navigation by Imaging Hidden Objects using Single-Photon LiDAR** ICRA 2025
A. Young^{*†}, N. M. Batagoda^{*}, H. Zhang, **A. Dave**, A. Pediredla, Dan Negrut, R. Raskar
Accepted for IEEE International Conference on Robotics and Automation 2025
- Blurred LiDAR for Sharper 3D: Robust Handheld 3D Scanning with Diffuse LiDAR and RGB (Highlight Poster)** CVPR 2025
N. Behari[†], A. Young, S. Somasundaram, T. Klinghoffer, **A. Dave**, R. Raskar
Accepted for IEEE/CVF Conference on Computer Vision and Pattern Recognition 2025
- A Roadmap for Generative Design of Visual Intelligence** MIT 2024
K. Tiwary[†], T. Klinghoffer, A. Young, S. Somasundaram, N. Behari, **A. Dave**, B. Cheung, D. Nilsson, T. Poggio, R. Raskar
An MIT Exploration of Generative AI: From Novel Chemicals to Opera, MIT Press
- 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

ORCa: Glossy Objects as Radiance Field Cameras (MIT Frontpage Spotlight) K. Tiwary*, A. Dave* , N. Behari, T. Klinghoffer, A. Veeraraghavan, R. Raskar <i>IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023</i>	CVPR 2023
First-Arrival Differential Counting for SPAD Array Design M. White, T. Zhang, A. Dave , S. Ghajari, A. C. Molnar, A. Veeraraghavan <i>MDPI Sensors Special Issue 2023</i>	Sensors 2023
Role of Transients in Two-Bounce Non-Line-of-Sight Imaging S. Somasundaram†, A. Dave , C. Henley, A. Veeraraghavan, R. Raskar <i>IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023</i>	CVPR 2023
PANDORA: Polarization-Aided Neural Decomposition Of Radiance A. Dave , Y. Zhao, A. Veeraraghavan <i>European Conference on Computer Vision 2022</i>	ECCV 2022
Snapshot Polarimetric Diffuse-Specular Separation A. Dave , Y. Hold-Geoffroy, M. Hašan, K. Sunkavalli, A. Veeraraghavan <i>Optica Optics Express 2022</i>	OE 2022
First Arrival Differential LiDAR Tianyi Zhang†, Mel White*, A. Dave* , S. Ghajari, A. Raghuram, A. Molnar, A. Veeraraghavan <i>International Conference on Computational Photography 2022</i>	ICCP 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 (Best Student Paper Prize) A. Dave , M. Balaji, P. Rangarajan, A. Veeraraghavan, M. Christensen <i>Opti Imaging and Applied Optics Congress 2020</i>	COSI 2020
Convolutional Approximations to the General NLOS Imaging Operator (Oral) 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

Recent Invited Talks

Invited Talk , Machine-Ground Interaction Consortium, Univeristy of Wisconsin Host: Dan Negrut	Sep 2025
CS Department Seminar , Indian Institute of Technology Indore Host: Puneet Gupta	Jul 2025
EE Department Seminar , Indian Institute of Technology Madras Host: Kaushik Mitra	Jul 2025
High Beams Seminar , University College London Host: Kaan Akşit	Apr 2025
ECE Department Seminar , Johns Hopkins University Host: Pablo Iglesias	Apr 2025
CS Department Seminar , Courant Institute, New York University Host: Daniele Panozzo	Mar 2025
CS Department Seminar , Stony Brook University Host: Prateek Prasanna	Mar 2025
Optics and Quantum Electronics Seminar , Massachusetts Institute of Technology Host: Dirk Englund	Feb 2025
Pacific Northwest Chapter Seminar , Society for Information Display Host: Arka Majumdar	Jan 2025
Computational Imaging Group Talk , Harvard University Host: Todd Zickler	Dec 2024
Oral Presentation , NECV Workshop, Yale University Host: Alex Wong	Nov 2024
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: Srinu 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

Professional Service

Organizer

Workshop on Neural Fields Beyond Conventional Cameras, ECCV 2024, CVPR 2025
Workshop on Extreme Sensing, MIT Media Lab Fall Meeting 2023, 2024

Publications Chair

IEEE ICCP 2024

Area Chair

IEEE ICCP 2025

Journal Reviewer

ACM Transactions on Graphics
IEEE T. Pattern Analysis and Machine Intelligence
IEEE T. Computational Imaging
IEEE Signal Processing Letters
Optica Applied Optics
Nature Communications

Conference Reviewer

CVPR (**Outstanding Reviewer**)
ECCV
SIGGRAPH Asia
SIGGRAPH
ICCP
IROS

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

San Jose, CA
2020

KTH Royal Institute of Technology

(**Svaagata Erasmus Mundus Scholarship**)
Semester Exchange Research
Advisor: Satyam Dwivedi

Stockholm, SE
2015

Patent Applications

First Arrival Differential LiDAR

A. Veeraraghavan, A. Molnar, M. White, T. Zhang, **A. Dave**, A. Raghuram, S. Ghajari
US Patent App. 18/676,223, 2024

2024

Generating physically-based material maps

A. Dave, K. Sunkavalli, Y. Hold-Geoffroy, M. Hasan
US Patent App. 17/233,861, 2022

2022

Media Coverage and Outreach

Superhuman Vision: AI sees what you can't

TEDxBoston Talk, 'Quin House Boston

2024

Seeing Beyond: Unlocking the Invisible with AI

INK Fellow Talk, Bangalore, India

2024

The Role of AI in Surgery

ISOPARB India Webinar

2024

ORCa: Glossy Objects as Radiance Field Cameras

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

2023

References

- Ramesh Raskar** (a3ramesh@media.mit.edu) MIT
Associate Director and Associate Professor, MIT Media Lab
Massachusetts Institute of Technology
- Ashok Veeraraghavan** (vashok@rice.edu) Rice
Department Chair and Professor, ECE Department
Rice University
- Wolfgang Heidrich** (wolfgang.heidrich@kaust.edu.sa) KAUST
Professor, CS and ECE Departments
King Abdullah University of Science and Technology
- Aswin Sankaranarayanan** (saswin@andrew.cmu.edu) CMU
Professor, ECE Department
Carnegie Mellon University