Akshat Dave

NCS 153, New Computer Science, Engineering Dr, Stony Brook, NY 11794
+1 713 837 8974 · dave@cs.stonybrook.edu · akshatdave.github.io

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 — Stony Brook, NY
Assistant Professor, Computer Science — 2025 - Present
PI, Photon Intelligence Lab

Massachusetts Institute of Technology — Cambridge, MA
Postdoctoral Associate, MIT Media Lab — 2023 - 2025
Advisor: Ramesh Raskar

Education

Rice University — Houston, TX
Ph.D. in Electrical and Computer Engineering — 2017 - 2023
Advisor: Ashok Veeraraghavan

Indian Institute of Technology Madras — Chennai, India
M.Tech. and B.Tech. in Electrical Engineering — 2012 - 2017
Advisor: Kaushik Mitra

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

29 peer-reviewed publications across computer vision (CVPR, ICCV, ECCV), computer graphics (TOG, SIGGRAPH Asia), optics/imaging (Optics Express, ICCP, TCI), and science (Science Advances) venues—including **9** first-author papers (1 best paper prize) and **11** papers with my advised mentees as first authors.

Grants

Generative Cameras: Automated Camera Design for Next-generation XR by Leveraging AI as a Scientist 2024
Samsung Research America, $150,000
Role: Co-investigator

Distributed and Private ML for Automotive Datasets 2024
Hyundai America Technical Center, $250,000
Role: Co-investigator

A Roadmap for Generative Design of Visual Intelligence 2024
An MIT Exploration of Generative AI, Seed Grant, $70,000
Role: Co-investigator

Mentorship

Graduate Research Mentor

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

Undergraduate Research Mentor

Nikhil Behari, Harvard → MIT	CVPRW 2024
Chaitanya Kapoor, BITS Pilani → UCSD	2024
Evelyn Zhu, MIT	2024
Abbas Shaikh, Rice	2023

Research Mentoring Fellow
Abdullah Zaher, Bridget Lee, Harry Golen, Natan Rivera 2023
Rice D2K Lab Capstone Program with Houston Fire Department

Teaching

Instructor

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

Teaching Assistant

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

Theses

Seeing the Invisible: Next-generation vision systems leveraging polarization and time-of-flight of light (Ralph Budd Thesis Award) 2023
Ph.D Thesis, Rice University

Compressive and Coded Image Recovery using Deep Recurrent Priors 2017
(Qualcomm Innovation Fellowship)
Masters Thesis, Indian Institute of Technology Madras

Publications

* indicates equal contribution and † indicates advised student

Imaging Hidden Objects with Consumer LiDAR via Motion Induced Sampling Nature 2026
S. Somasundaram, A. Young, **A. Dave**, A. Pediredla, R. Raskar
Nature 2026

Learning 3D Reconstruction with Priors in Test Time CVPR 2026
L. Zhou, H. Wu, **A. Dave**, D. Samaras
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2026

Task-Driven Implicit Representations for Automated Design of LiDAR Systems CVPR 2026
(Highlight Poster)
N. Behari†, A. Young, T. Klinghoffer, **A. Dave**, R. Raskar
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2026

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 TOG 2025
(ACM Showcase)
A. Dave, T. Zhang*, A. Young*, R. Raskar, W. Heidrich, A. Veeraraghavan
ACM Transactions on Graphics

What if Eye...? Computationally Recreating Vision Evolution Sci. Adv. 2025
K. Tiwary†, A. Young, Z. Tasneem, T. Klinghoffer, **A. Dave**, T. Poggio, D. Nilsson, B. Cheung, R. Raskar
Science Advances 2025

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
IEEE International Conference on Robotics and Automation 2025

Blurred LiDAR for Sharper 3D: Robust Handheld 3D Scanning with Diffuse LiDAR and RGB CVPR 2025
(Highlight Poster)
N. Behari†, A. Young, S. Somasundaram, T. Klinghoffer, **A. Dave**, R. Raskar
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2025

Shoot-Bounce-3D: Single-Shot Occlusion-Aware 3D from Lidar by Decomposing Two-Bounce Light SA 2025
T. Klinghoffer, S. Somasundaram, X. Xiang, Y. Fan, C. Richardt, **A. Dave**, R. Raskar, R. Ranjan
ACM SIGGRAPH Asia 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) CVPR 2023
K. Tiwary*, **A. Dave***, N. Behari, T. Klinghoffer, A. Veeraraghavan, R. Raskar
IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023

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

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
Optica 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

Foveated Non Line of Sight Imaging (Best Student Paper Prize) COSI 2020
A. Dave, M. Balaji, P. Rangarajan, A. Veeraraghavan, M. Christensen
Opti Imaging and Applied Optics Congress 2020

Convolutional Approximations to the General NLOS Imaging Operator (Oral) ICCV 2019
B. Ahn, **A. Dave**, A. Veeraraghavan, I. Gkioulekas, A. C. Sankaranarayanan
International Conference of Computer Vision 2019

SNLOS: Non-line-of-sight Scanning through Temporal Focusing ICCP 2019
A. Pediredla*, **A. Dave***, A. Veeraraghavan
International Conference on Computational Photography 2019

Solving Inverse Computational Imaging Problems Using Deep Pixel-Level Prior TCI 2018
A. Dave, A. K. Vadathya, R. Subramanyam, R. Baburajan, K. Mitra
IEEE Transactions on Computational Imaging 2018

SILC: Smoother Imitation with Lipschitz Costs ICMLW 2018
S. Chaudhary*, **A. Dave***, B. Ravindran
Workshop on Goal Specification in Reinforcement Learning at ICML 2018

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 — Cambridge, MA
Visiting Student, MIT Media Lab — 2022
Advisor: Ramesh Raskar

Adobe Research — San Jose, CA
Research Intern — 2020
Manager: Kalyan Sunkavalli

KTH Royal Institute of Technology — Stockholm, SE
(Svaagata Erasmus Mundus Scholarship) — 2015
Semester Exchange Research
Advisor: Satyam Dwivedi

Patent Applications

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

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

Seeing Beyond: Unlocking the Invisible with AI — 2024
INK Fellow Talk, Bangalore, India

The Role of AI in Surgery — 2024
ISOPARB India Webinar

ORCa: Glossy Objects as Radiance Field Cameras — 2023
MIT Front Page Spotlight. Featured in SciTechDaily, MarkTechPost and more.