Mohit Gupta
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Research Interests

Computer Vision, Computational Imaging, Robotics

Education

Ph.D. in Robotics, Carnegie Mellon University	2005 - 2011
M.S. in Computer Science, Stony Brook University	2003 – 2005
B.Tech. in Computer Sc. and Engineering, Indian Insitute of Technology, Delhi	1999 – 2003

Professional Experience

Associate Professor, University of Wisconsin-Madison	2022 -
Assistant Professor, University of Wisconsin-Madison	2016 - 2022
Research Scientist, Cruise LLC (on academic leave)	2023 - 2025
Co-founder and Scientific Advisor, Ubicept Inc.	2021 -
Post-doctoral Research Scientist, Columbia University	2011 - 2015
Research Intern, Mitsubishi Electric Research Labs	2009, 2010

Awards and Honors

Vilas Associate Award, UW Madison	2026-27
Sony Faculty Innovation Award	2025, 23, 22, 21, 20

Best of ACM SIGGRAPH Emerging Technologies (E-Tech) Award	2024
Marr Prize Honorable Mention, IEEE Int. Conf. on Computer Vision (ICCV)	2019
NSF CAREER Award	2019
Finalist, Most Influential Research Category, AutoSens Conference Awards	2019
Paper Selected for IJCV Special Issue on Best Papers of ECCV	2018
Best Paper Honorable Mention, IEEE Int. Conf. on Computational Photography (ICCP)	2014
(Advisee Award) Varun Sundar: Ivanisevic Award (Outstanding PhD Research), UW-Madison	2026
(Advisee Award) Sizhuo Ma: Best PhD Thesis Award, CS Department, UW-Madison	2022

Professional Service and Activities

Program Chair: IEEE ICCP 2023 (Madison); IEEE ICCP 2019 (Tokyo); Workshop on Computational Cameras and Displays (with IEEE CVPR 2017, 2018)

Best Paper Awards Committee: IEEE Conf. on Computer Vision and Pattern Recognition (CVPR 2022)

Program Committee (Area Chair): CVPR 2027, ICLR 2027, NeurIPS 2026, ICML 2026 (Position Papers), CVPR 2026 (Lead Area Chair), ECCV 2026 (Lead Area Chair), ICCV 2025 (Senior Area Chair), CVPR 2025 (Lead Area Chair), NeurIPS 2025, 24, ICML 2025, CVPR 2024, 23, 21, ECCV 2024, ICCV 2023, 21, WACV 2023, ECCV 2022, SIGGRAPH Asia 2018, Pacific Graphics 2018

Editorial Board: International Journal of Computer Vision (IJCV) Special Issue

Conference Organization: Summer School Chair (IEEE ICCP 2027); Workshops Chair (IEEE CVPR 2022); Finance Chair (IEEE ICCP 2018); Demos and Posters Chair (IEEE ICCP 2016)

Tutorial Organization: Co-organized tutorials on single-photon imaging at ICCP 2025; computational imaging at ICIP 2015, ICIP 2016; time-of-flight (ToF) imaging at ICCV 2015; compressive sensing of videos at CVPR 2012; symposium on volumetric scattering at CVPR 2007

Reviewing: NSF CAREER Award Panels, Nature, Nature Communications, Communications of the ACM, ACM SIGGRAPH, SIGGRAPH Asia, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), IJCV, IEEE Transactions on Image Processing, ICCV, CVPR, ECCV, ICCP

Professional Service Awards: Outstanding reviewer award, ECCV 2020

Internal (U. Wisconsin) Service: University Search Committee for Associate Vice Chancellor for Entrepreneurship (2025); University Search Committee for Vice Chancellor for Research (2023)

Conference and Journal Publications

2026 [1] [2]

Quanta Perception as Probabilistic Events
Varun Sundar[S], Pavan Thodima[S], Sacha Jungerman[S], **Mohit Gupta**
Nature Communications 2026

VisionSIM: Beyond Idealized Sensors — A Multi-Modal Simulator for Robot Perception
Sacha Jungerman[S], Kaustubh Sadekar[C], Avery Gump[S], Sriram Narayanan[C], Shantanu Gupta[S], Bhuyashi Deka[S], Srinivasa Narasimhan[C], Atul Ingle[C], **Mohit Gupta**
Conference on Robot Learning (CoRL) 2026
Spotlight Presentation (top ∼ 3% submissions)

Ghosts in the Point Clouds: De-glaring LiDAR in the Transient Domain
Avery Gump[S], Connor Henley[S], Sungjin Cheong[S], Akarsh Prabhakara[C], **Mohit Gupta**
IEEE/CVF CVPR 2026

gQIR: Generative Quanta Image Reconstruction
Aryan Garg[S], Sizhuo Ma[C], **Mohit Gupta**
IEEE/CVF CVPR 2026
Highlight Presentation

Fundamental Recovery Bounds for SPAD Signals of Stationary Poissonian Flux
Lior Dvir[C], Nadav Torem[C], **Mohit Gupta**, Yoav Schechner[C]
IEEE ICCP 2026

Hi-SPAD: Video-Rate Hyperspectral Imaging and Inference with Single-Photon Cameras
Haejoon Lee[C], **Mohit Gupta**, Vijayakumar Bhagavatula[C], Aswin Sankaranarayanan[C]
ACM Transactions on Graphics (presented at SIGGRAPH 2026)

Radiance Fields from Photons
Sacha Jungerman[S], Aryan Garg[S], and **Mohit Gupta**
ACM Transactions on Graphics (presented at SIGGRAPH 2026)

2025

Adapting Frame-Based Networks for Stable and Robust Video Inference
Matthew Dutson[S], Nathan Labiosa[S], Yin Li[C], and **Mohit Gupta**
Proc. NeurIPS 2025

[1] Collaborators are denoted by[C], thesis and post-doc advisors by[A], and students and post-docs under my supervision by[S].

[2] ICCV, ECCV and CVPR are the top three conferences in computer vision, with acceptance rates typically around 25%. A few selected papers (typically $2-4\%$) are awarded an oral presentation. ACM Transactions on Graphics (TOG) and ACM SIGGRAPH are the premier journal/conference in computer graphics, with an acceptance rate around 20%. IEEE PAMI, IJCV, IEEE TIP and IEEE RAL are the main journals in computer vision, image processing and robotics, respectively. 3DV and ICCP are smaller conference for 3D vision and computational imaging and photography. Acceptance rates are typically around $30-40\%$.

Quanta Neural Networks: From Photons to Perception
Varun Sundar[S], Tianyi Zhang[C], Sacha Jungerman[S], and **Mohit Gupta**
Proc. IEEE ICCV 2025

Recovering Parametric Scenes from Very Few Time-of-Flight Pixels
Carter Sifferman[S], Yiquan Li[C], Yiming Li[C], Fangzhou Mu[C], Michael Gleicher[C], **Mohit Gupta**, Yin Li
Proc. IEEE ICCV 2025

Robust 3D Object Detection using Probabilistic Point Clouds from Single-Photon LiDARs
Bhavya Goyal[S], Felipe Gutierrez-Barragan[C], Wei Lin[C], Andreas Velten[C], Yin Li[C], and **Mohit Gupta**
Proc. IEEE ICCV 2025

Predicting Important Photons for Energy-Efficient Single-Photon Videography
Shantanu Gupta[S], Varun Sundar[S], Lucas Koerner[C], C. Bruschini[C], E. Charbon[C], and **Mohit Gupta**
IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI); Proc. IEEE ICCP 2025
Special Issue (Best of ICCP 2025)

Efficient Detection of Objects Near a Robot Manipulator via Miniature Time-of-Flight Sensors
Carter Sifferman[S], **Mohit Gupta**, Michael Gleicher[C]
IEEE Robotics and Automation Letters (RAL); Proc. IEEE ICRA 2026

Quanta Computer Vision
Varun Sundar[S], and **Mohit Gupta**
ACM Crossroads (XRDS), 31(2); Invited Article

Privacy-Enabled Parallax Display
Sizhuo Ma[C], Karl Bayer[C], Guru Krishnan[C], **Mohit Gupta**, and Shree Nayar[C]
IEEE Virtual Reality Conference (VR 2025)

Streaming Quanta Sensors for Online, High-Performance Imaging and Vision
Tianyi Zhang[C], Matthew Dutson[S], Vivek Boominathan[C], **Mohit Gupta**, and Ashok Veeraraghavan[C]
IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI 2025)

2024

Light-in-Flight for a World-in-Motion
Jongho Lee[S], Ryan J. Suess[C], and **Mohit Gupta**
ECCV 2024

Photon Inhibition for Energy-Efficient Single-Photon Imaging
Lucas J. Koerner[C], Shantanu Gupta[S], Atul Ingle[C], and **Mohit Gupta**
ECCV 2024
Oral Presentation

Light Codes for Fast Two-Way Human-Centric Visual Communication
Mohit Gupta, Jian Wang[c], Karl Bayer[c], Shree Nayar[c]
ACM Transactions on Graphics (presented at SIGGRAPH 2024)

A Live Demo of Single-Photon Imaging and Applications
Sacha Jungerman[s], Varun Sundar[s], and **Mohit Gupta**
ACM SIGGRAPH 2024 Emerging Technologies (E-Tech); IEEE CVPR Demos
Best of SIGGRAPH E-Tech Award

Using a Distance Sensor to Detect Deviations in a Planar Surface
Carter Sifferman[s], William Sun[c], **Mohit Gupta**, Michael Gleicher[c]
IEEE Robotics and Automation Letters (RAL); Proc. IEEE ICRA 2025

Generalized Event Cameras
Varun Sundar[s], Matthew Dutson[s], A. Ardelean[c], C. Bruschini[c], Edoardo Charbon[c], and **Mohit Gupta**
IEEE/CVF CVPR 2024

Towards 3D Vision with Low-Cost Single-Photon Cameras
Fangzhou Mu*[c], Carter Sifferman*[s], Sacha Jungerman[s], Yiquan Li[c], Mark Han[c], Michael Gleicher[c], **Mohit Gupta**, Yin Li[c]
IEEE/CVF CVPR 2024

2023

CASPI: Collaborative Photon Processing for Active Single-Photon Imaging
Jongho Lee[s], Atul Ingle[c], Jenu Chacko[c], Kevin Elicieri[c], and **Mohit Gupta**
Nature Communications

Seeing Photons in Color
Sizhuo Ma[s], Varun Sundar[s], Paul Mos[c], Claudio Bruschini[c], Edoardo Charbon[c], and **Mohit Gupta**
ACM Transactions on Graphics (SIGGRAPH 2023)

SoDaCam: Software-defined Cameras via Single-Photon Imaging
Varun Sundar[s], Andrei Ardelean[c], Tristan Swedish[c], C Bruschini[c], Edoardo Charbon[c], and **Mohit Gupta**
IEEE ICCV 2023
Oral Presentation

Eventful Transformers: Leveraging Temporal Redundancy in Vision Transformers
Matthew Dutson[s], Yin Li[c], and **Mohit Gupta**
IEEE ICCV 2023

Computational 3D Imaging with Position Sensors
Jeremy Klotz[c], **Mohit Gupta**, Aswin Sankaranarayanan[c]
IEEE ICCV 2023
Oral Presentation

Learned Compressive Representations for Single-Photon 3D Imaging
Felipe Gutierrez-Barragan[S], Fangzhou Mu[C], Andrei Ardelean[C], Atul Ingle[C], Claudio Bruschini[C], Edoardo Charbon[C], Yin Li[C], **Mohit Gupta**, Andreas Velten[C]
IEEE ICCV 2023

Eulerian Single-Photon Vision
Shantanu Gupta[S], and **Mohit Gupta**
IEEE ICCV 2023

Panoramas from Photons
Sacha Jungerman[S], Atul Ingle[C], and **Mohit Gupta**
IEEE ICCV 2023

Mitigating AC and DC Interference in Multi-ToF-Camera Environments
Jongho Lee[S], and **Mohit Gupta**
IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)

Unlocking the Performance of Proximity Sensors by Transient Histograms
Carter Sifferman[S], Yeping Wang[C], **Mohit Gupta**, and Michael Gleicher[C]
IEEE Robotics and Automation Letters (RAL); Proc. IEEE ICRA 2024

When Two Cameras Are a Crowd (Understanding Interference Across Multiple Active Cameras)
Jongho Lee[S], **Mohit Gupta**, Bhuvana Krishnaswamy[C], and Suman Banerjee[C]
Communications of the ACM

Burst Vision Using Single-Photon Cameras
Sizhuo Ma[S], Paul Mos[C], Edoardo Charbon[C], and **Mohit Gupta**
IEEE/CVF WACV 2023

Spike-Based Anytime Perception
Matt Dutson[S], Yin Li[C], and **Mohit Gupta**
IEEE/CVF WACV 2023

QFaR: Location-Guided Scanning of Visual Codes from Long Distances
Sizhuo Ma[S], J. Wang[C], W. Chen[C], S. Banerjee[C], **Mohit Gupta**, S. Nayar[C]
ACM MobiCom 2023

2022

Event Neural Networks
Matt Dutson[S], Yin Li[C], and **Mohit Gupta**
ECCV 2022

3D Scene Inference from Transient Histograms
Sacha Jungerman[S], Atul Ingle[C], Yin Li[C], and **Mohit Gupta**
ECCV 2022

Robust Scene Inference under Noise-Blur Dual Corruptions
Bhavya Goyal[S], JF Lalonde[C], Yin Li[C], and **Mohit Gupta**
IEEE ICCP 2022

Geometric Calibration of Single-Pixel Distance Sensors
Carter Sifferman[S], Dev Mehrotra[S], **Mohit Gupta**, and Michael Gleicher[C]
IEEE Robotics and Automation Letters (RAL); Proc. IEEE/RSJ IROS 2022

Single-Photon Structured Light
Varun Sundar[S], Sizhuo Ma[S], Aswin Sankaranarayanan[C], and **Mohit Gupta**
IEEE/CVF CVPR 2022

Compressive Single-Photon 3D Cameras
Felipe Gutierrez-Barragan[S], Atul Ingle[C], Trevor Seets[C], **Mohit Gupta**, and Andreas Velten[C]
IEEE/CVF CVPR 2022

Single-Photon Camera Guided Extreme Dynamic Range Imaging
Yuhao Liu[C], Felipe Gutierrez-Barragan[S], Atul Ingle[C], **Mohit Gupta**, and Andreas Velten[C]
IEEE/CVF WACV 2022

iToF2dToF: A Robust and Flexible Representation for Data-driven Time-of-Flight Imaging
Felipe Gutierrez-Barragan[S], Huaijin Chen[C], **Mohit Gupta**, Andreas Velten[C], Jinwei Gu[C]
IEEE Transactions on Computational Imaging 2022

2021

Photon-Starved Scene Inference using Single Photon Cameras
Bhavya Goyal[S], and **Mohit Gupta**
IEEE ICCV 2021

Blocks-World Cameras
Jongho Lee[S], and **Mohit Gupta**
IEEE/CVF CVPR 2021
Oral Presentation

Passive Inter-Photon Imaging
Atul Ingle[S], T Seets[C], M Buttafava[C], Shantanu Gupta[S], A Tosi[C], Andreas Velten[C], and **Mohit Gupta**
IEEE/CVF CVPR 2021
Oral Presentation

Invisible Perturbations: Physical Adversarial Examples Exploiting the Rolling Shutter Effect
Athena Sayles[c], Ashish Hooda[c], **Mohit Gupta**, Rahul Chatterjee[c], and Earlence Fernandes[c]
IEEE/CVF CVPR 2021

2020

Quanta Burst Photography
Sizhuo Ma[s], Shantanu Gupta[s], Arin Ulku[c], Claudio Bruschini[c], Edoardo Charbon[c], and **Mohit Gupta**
ACM Transactions on Graphics (SIGGRAPH 2020)

Smart Time-Multiplexing of Quads Solves the Multicamera Interference Problem
Tomislav Pribanic[c], Tomislav Petkovi[c], David Bojani[c], Kristijan Bartol[c], and **Mohit Gupta**
International Conference on 3D Vision (3DV) 2020

Inertial Safety from Structured Light
Sizhuo Ma[s], and **Mohit Gupta**
ECCV 2020

2019

Asynchronous Single-Photon 3D Imaging
Anant Gupta[s], Atul Ingle[s], and **Mohit Gupta**
IEEE ICCV 2019
Marr Prize Honorable Mention; Oral Presentation

Stochastic Exposure Coding for Handling Multi-ToF-Camera Interference
Jongho Lee[s], and **Mohit Gupta**
IEEE ICCV 2019
Oral Presentation

Micro-Baseline Structured Light
Viswa Venkatas[c], Jian Wang[c], **Mohit Gupta**, and Shree Nayar[c]
IEEE ICCV 2019

Practical Coding Function Design for Time-of-Flight Imaging
Felipe Gutierrez-Barragan[s], Syed Reza[c], Andreas Velten[c], and **Mohit Gupta**
IEEE/CVF CVPR 2019

Photon-Flooded Single Photon 3D Cameras
Anant Gupta[s], Atul Ingle[s], Andreas Velten[c], and **Mohit Gupta**
IEEE/CVF CVPR 2019
Oral Presentation

Passive High Flux Imaging with Single Photon Cameras
Atul Ingle[S], Andreas Velten[C]and **Mohit Gupta**
IEEE/CVF CVPR 2019
Oral Presentation

Differential Scene Flow from Light-Field Gradients
Sizhuo Ma[S], Brandon Smith[S], and **Mohit Gupta**
International Journal of Computer Vision (IJCV 2019)
Special Issue on Best Papers of ECCV 2018

Coding Scheme Optimization for Fast Fluorescence Lifetime Imaging
Jongho Lee[S], JV Chacko[O], B Dai[O], SA Reza[O], AK Sagar[O], K Eliceiri[C], A Velten[C], and **Mohit Gupta**
ACM Transactions on Graphics (presented at SIGGRAPH 2019)

2018

What Are Optimal Coding Functions for Time-of-Flight Imaging?
Mohit Gupta, Shree Nayar[C], Andreas Velten[C], Eric Breitbach[C]
ACM Transactions on Graphics (presented at SIGGRAPH 2018)
Finalist, Most Influential Research category AutoSens Awards, 2019

A Geometric Perspective on Structured Light Coding
Mohit Gupta, and Nikhil Nakhates
ECCV 2018

3D Scene Flow from 4D Light Field Gradients
Sizhuo Ma[S], Brandon Smith[S], and **Mohit Gupta**
ECCV 2018
Oral Presentation; Selected for IJCV Special issue on 'Best of ECCV'

Trapping Light for Time of Flight
Ruilin Xu [C], **Mohit Gupta**, Shree Nayar[C]
IEEE/CVF CVPR
Oral Presentation

Tracking Objects Outside the Line of Sight using Speckle Imaging
Brandon Smith[S], Matthew O'Toole[C], and **Mohit Gupta**
IEEE/CVF CVPR
Oral Presentation

SH-ToF: Micro Resolution Time-of-Flight Imaging with Superheterodyne Interferometry
Fengqiang Li[C], F Willomitzer[C], P Rangarajan[C], **Mohit Gupta**, Andreas Velten[C], Oliver Cossairt[C]
IEEE ICCP 2018

2016-17

CoLux: Multi-Object 3D Micro-Motion Analysis Using Speckle Imaging
Brandon Smith[S], Pratham Desai[S], Vishal Agrawal[S], and **Mohit Gupta**
ACM Transactions on Graphics (SIGGRAPH 2017)

High-depth-resolution Range Imaging with Multiple-wavelength Superheterodyne Interferometry using 1550-nm Lasers
Fengqiang Li[c], Joshua Yablon[c], Andreas Velten[c], **Mohit Gupta**, and Oliver Cossairt[c]
Applied Optics 2017

Dual Structured Light 3D using a 1D Sensor
Jian Wang[c], Aswin Sankaranarayanan[c], **Mohit Gupta**, and Srinivasa Narasimhan[c]
ECCV 2016
Oral Presentation

DisCo: Display-Camera Communication Using Rolling Shutter Sensors
Kensei Jo[c], **Mohit Gupta**, and Shree Nayar[a]
ACM Transactions on Graphics (ACM TOG 2016), presented at SIGGRAPH 2016

2015 and Earlier

SpeDo: 6 DOF Ego-Motion Sensor Using Speckle Defocus Imaging
Kensei Jo[c], **Mohit Gupta**, and Shree Nayar[a]
IEEE ICCV 2015

Phasor Imaging: A Generalization of Correlation Based Time-of-Flight Imaging
Mohit Gupta, Shree Nayar[a], Matthias Hullin[c], and Jaime Martin[c]
ACM Transactions on Graphics (ACM TOG 2015), presented at SIGGRAPH 2015

LiSens: A Scalable Architecture for Video Compressive Sensing
Jian Wang[c], **Mohit Gupta**, and Aswin Sankaranarayanan[c]
IEEE ICCP 2015

MC3D: Motion Contrast 3D Scanning
Nathan Matsuda[c], Oliver Cossairt[c], and **Mohit Gupta**
IEEE ICCP 2015

Digital Refocusing with Incoherent Holography
Oliver Cossairt[c], Nathan Matsuda[c], and **Mohit Gupta**
IEEE ICCP 2014
Best paper honorable mention

Recovering Scene Geometry Under Wavy Fluid Via Distortion And Defocus Analysis
Mingjie Zhang, Xing Lin, Mohit Gupta, Jinli Suo and Qionghai Dai
ECCV 2014

Fibonacci Exposure Bracketing for High Dynamic Range Imaging
Mohit Gupta, Daisuke Iso and Shree Nayar
IEEE ICCV 2013

Structured Light in Sunlight
Mohit Gupta, Qi Yin and Shree Nayar
IEEE ICCV 2013

Efficient Space-Time Sampling with Pixel-wise Coded Exposure for High Speed Imaging
Dengyu Liu, Jinwei Gu, Yasunobu Hitomi, Mohit Gupta, Tomoo Mitsunaga and Shree Nayar
IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE TPAMI 2013)

Micro Phase Shifting
Mohit Gupta and Shree Nayar
IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE CVPR 2012)
Oral Presentation

Diffuse Structured Light
Shree Nayar and Mohit Gupta
IEEE ICCP 2012

3D Scanning in the Presence of Interreflections, Subsurface Scattering and Defocus
Mohit Gupta, Amit Agrawal, Ashok Veeraraghavan and Srinivasa Narasimhan
International Journal of Computer Vision (IJCV 2012)

When Does Computational Imaging Improve Performance?
Oliver Cossairt, Mohit Gupta and Shree Nayar
IEEE Transactions on Image Processing (TIP 2012)

Video from a Single Exposure Coded Photograph using a Learned Over-Complete Dictionary
Yasunobu Hitomi, Jinwei Gu, Mohit Gupta and Shree Nayar
IEEE ICCV 2011

Multiplexed Illumination for Scene Recovery in the Presence of Global Illumination
Jinwei Gu, Toshihiro Kobayashi, Mohit Gupta and Shree Nayar
IEEE ICCV 2011
Oral Presentation

Structured Light 3D Scanning Under Global Illumination
Mohit Gupta, Amit Agrawal, Ashok Veeraraghavan and Srinivasa Narasimhan
IEEE CVPR 2011

A Combined Theory of Defocused Illumination and Global Light Transport
Mohit Gupta, Yuandong Tian, Srinivasa Narasimhan and Li Zhang
International Journal of Computer Vision (IJCV 2011)

Flexible Voxels for Motion-Aware Videography
Mohit Gupta, Amit Agrawal, Ashok Veeraraghavan and Srinivasa Narasimhan
ECCV 2010

Optimal Coded Sampling for Temporal Super-Resolution
Amit Agrawal, Mohit Gupta, Ashok Veeraraghavan and Srinivasa Narasimhan
IEEE CVPR 2010

(De) Focusing on Global Light Transport for Active Scene Recovery
Mohit Gupta, Yuandong Tian, Srinivasa Narasimhan and Li Zhang
IEEE CVPR 2009
Oral Presentation

On Controlling Light Transport in Poor Visibility Environments
Mohit Gupta, Srinivasa Narasimhan and Yoav Schechner
IEEE CVPR 2008

High Resolution Tracking of Non-Rigid 3D Motion Using Harmonic Maps
Yang Wang, Mohit Gupta, Song Zhang, Sen Wang, Xianfeng Gu, Dimitris Samaras and Peisen Huang
International Journal of Computer Vision (IJCV 2008)

Legendre Fluids: Reduced Space Modeling and Rendering of Participating Media
Mohit Gupta and Srinivasa Narasimhan
Eurographics/ ACM SIGGRAPH Symposium on Computer Animation (SCA 2007)

Acquiring Scattering Properties of Participating Media by Dilution
Srinivasa Narasimhan, Mohit Gupta, Craig Donner, Ravi Ramamoorthi, Shree Nayar, HenrikWann Jensen
ACM Transactions on Graphics (SIGGRAPH 2006)

High Resolution Tracking of Non-Rigid 3D Motion Using Harmonic Maps
Yang Wang, Mohit Gupta, Song Zhang, Sen Wang, Xianfeng Gu, Dimitris Samaras and Peisen Huang
IEEE ICCV 2005
Oral Presentation

Multilevel Modeling and Rendering of Architectural Scenes
A. Kushal, G. Chanda, K. Srivastava, M. Gupta, S. Sanyal, T.V.N. Sri Ram, P. Kalra and S. Banerjee
Eurographics 2003

Invited Book Chapters

Depth Recovery from Time-of-Flight Imaging
Mohit Gupta
Coded Optical Imaging, 2024, Publisher: Springer Nature

Performance Limits for Motion Deblurring Cameras
Oliver Cossairt and Mohit Gupta
Motion Deblurring: Algorithms and Systems, 2014, Publisher: Cambridge University Press

Patents

Systems, Methods, And Media For Generating And Using Quanta Neural Networks For Computer Vision
Inventors: Mohit Gupta, Varun Sundar
Patent filed; September 2025

Dappled Illumination For Depth Sensors
Inventors: Mohit Gupta and Antonni Jaakkola
Patent filed; August 2025

Systems, Methods, And Media For Capturing Single-Photon Video With Improved Energy Efficiency
Inventors: Mohit Gupta, Shantanu Gupta, Varun Sundar, Lucas Koerner
Patent filed; July 2025

Systems, methods, and media for estimating depths in a scene using single-photon detectors and binary structured light codes patterns
Inventors: Varun Sundar and Mohit Gupta
US Patent 12,373,967; Issued July 2025
Optioned for Licensing

Single Photon Color Imaging
Inventors: Mohit Gupta, Varun Sundar, Tianyi Zhang, Ashok Veeraraghavan
Patent filed; June 2025
Optioned for Licensing

Streaming Quanta Sensors For Online, High-Performance Imaging And Vision
Inventors: Mohit Gupta, Matthew Dutson, Ashok Veeraghavan, Tianyi Zhang, Vivek Boominathan
Patent filed; May 2025

Systems, Methods, And Media For Eulerian Single-Photon Computer Vision
Inventors: Mohit Gupta, Shantanu Gupta
US Patent 12,223,620; Issued: February 2025
Optioned for Licensing

Systems And Methods For Quanta Sensing For High-Performance Quantum Computing
Inventors: Mohit Gupta, Mark Saffman, Andreas Velten, Swamit Tannu
Patent filed; October 2024

Systems, Methods, And Media For Single Photon Depth Imaging With Improved Precision In Ambient Light
Inventors: Anant Gupta, Atul Ingle, Andreas Velten and Mohit Gupta
US patent 12,078,720 B2; Issued September 2024

Systems, methods, and media for generating digital images using low bit depth image sensor data
Inventors: Mohit Gupta and Matthew Dutson
US Patent 12,743,747 B2; Issued September 2026
Optioned for Licensing

Systems And Methods For Implementing Software-Defined Cameras
Inventors: Mohit Gupta, Varun Sundar
Patent filed; July 2024
Optioned for Licensing

Systems, Methods, And Media For Concurrent Depth And Motion Estimation Using Indirect Time Of Flight Imaging
Inventors: Mohit Gupta, Jongho Lee
Patent filed; June 2024

Generalized Event Camera
Inventors: Mohit Gupta, Matthew Dutson, Varun Sundar
Patent filed; April 2024
Optioned for Licensing

Systems, Methods, And Media For Single-Photon Imaging With Improved Energy Efficiency
Inventors: Mohit Gupta, Lucas Koerner, Atul Ingle
US patent 12,739,533 B2; Issued September 2026
Optioned for Licensing

Systems, Methods, And Media For Improving Signal-To-Noise Ratio In Single-Photon Data
Inventors: Jongho Lee, Mohit Gupta
US Patent 11,927,700, US 12,710,517 B2; Issued: March 2024

Systems, Methods, And Media For High Dynamic Range Imaging using Single-Photon and Conventional Image sensor Data
Inventors: Felipe Gutierrez-Barragan, Yuhao Liu, Atul Ingle, Mohit Gupta and Andreas Velten
US Patents 11,758,297; 12,445,746; Issued September 2023
Optioned for Licensing

Vision Transformers Leveraging Temporal Redundancy
Inventors: Matthew Dutson, Yin Li, Mohit Gupta
Patent filed; September 2023
Optioned for Licensing

Systems And Methods For Scene Reconstruction Using A High-Speed Imaging Device
Inventors: Mohit Gupta, Sacha Jungerman
Patent filed; July 2023
Optioned for Licensing

Systems, Methods, And Media For Estimating A Depth And Orientation Of A Portion Of A Scene Using A Single-Photon Detector And Diffuse Light Source
Inventors: Atul Ingle, Sacha Jungerman, Yin Li, Mohit Gupta
US Patent 12,705,768 B2; Issued August 2026

Systems, Methods, And Media For Stochastic Exposure Coding That Mitigates Multi-Camera Interference In Continuous Wave Time-Of-Flight Imaging
Inventors: Jongho Lee and Mohit Gupta; Issued October 2022
US Patent 11474249

Systems, methods, and media for asynchronous single photon depth imaging with improved precision in ambient light
Inventors: Anant Gupta, Atul Ingle and Mohit Gupta
US Patent 11,448,767 B2; Issued September 2022

Systems, Methods, And Media For Directly Recovering Planar Surfaces In A Scene Using Structured Light
Inventors: Jongho Lee and Mohit Gupta
US Patent 11398085; Issued July 2022

Systems, Methods, And Media For Single Photon Depth Imaging With Improved Efficiency Using Learned Compressive Representations
Inventors: Felipe Gutierrez Barragan, Andreas Velten, Fangzhou Mu, Yin Li, Mohit Gupta, Atul Ingle
Patent filed; July 2022

Systems, Methods, And Media For Single Photon Depth Imaging With Improved Efficiency Using Compressive Histograms
Inventors: Andreas Velten, Felipe Gutierrez Barragan, Mohit Gupta, Trevor Seets, Atul Ingle
US Patent 12,571,884 B2; Issued March 2026

Systems, Methods, And Media For Generating And Using Neural Networks Having Improved Efficiency For Analyzing Video
Inventors: Mohit Gupta, Matthew Dutson
US Patent 12,572,806 B2; Issued March 2026
Optioned for Licensing

Systems, Methods, And Media For High Dynamic Range Quanta Burst Imaging
Inventors: Sizhuo Ma and Mohit Gupta
US Patents 11170549; 11721054; Issued November 2021
Licensed and Productized

Systems, Methods, And Media For Generating And Using Spiking Neural Networks With Improved Efficiency
Inventors: Matthew Dutson and Mohit Gupta
US Patent Application P210141US01, Filing Date: April 2021

Low Power Light Wave Communication for Mobile and Wearable Devices
Inventors: Shree K. Nayar, Mikhail Fridberg, Mohit Gupta
US patent 11,082,129 B1

Augmented Reality System using Structured Light
Inventors: Mohit Gupta, Shree K. Nayar, Viswanath Saragadam
US patent 10,909,373 B1

Systems, methods, and media for encoding structured light imaging patterns and estimating depths in a scene
Inventor: Mohit Gupta
US patent 10,818,023; Issued October 2020

Systems, Methods And, Media For Determining Object Motion In Three Dimensions From Light Field Image Data
Inventors: Mohit Gupta, Sizhuo Ma, Brandon Smith
US patent 10,706,564; Issued July 2020

Systems, methods, and media for HDR imaging using dead-time-limited single photon detectors
Inventors: Mohit Gupta, Atul Ingle, Andreas Velten
US patent 10,616,512; Issued April 2020
Licensed / Optioned for Licensing

Systems, methods, and media for encoding and decoding signals used in time-of-flight imaging
Inventors: Felipe Gutierrez, Mohit Gupta, Eric Breitbach, Andreas Velten, Shree Nayar
US patent 10,739,447 B2; Issued August 2020
Optioned for Licensing

Systems, methods, and media for encoding and decoding signals used in time-of-flight imaging
Inventors: Mohit Gupta, Eric Breitbach, Andreas Velten, Shree Nayar
US patent 10,645,367 B2; Issued May 2020
Optioned for Licensing

Systems, methods, and media for determining object motion in 3D using speckle images
Inventors: Mohit Gupta, Brandon Smith, Pratham Desai, Vishal Agarwal
US patent 10,152,798 B2; Issued December 2018
Nominated as one of six finalists out of 400 applications in WARF Innovation Awards 2017

Systems, methods, and media for performing shape measurement
Inventors: Mohit Gupta, Shree Nayar
US patent US 2015/0176982 A1
Licensed and Productized

Methods, systems, and media for high dynamic range imaging
Inventors: Mohit Gupta, Tomoo Mitsunaga, Daisuke Iso, Shree Nayar
US patent 9,648,248 B2

Structured Light for 3D Shape Reconstruction Subject to Global Illumination
Inventors: Mohit Gupta, Ashok Veeraraghavan, Amit Agrawal
US patent 8,811,767 B2

Video Camera for Acquiring Images with Varying Spatio-Temporal Resolutions
Inventors: Mohit Gupta, Ashok Veeraraghavan, Amit Agrawal, Srinivasa Narasimhan
US patent publication number 2011/0243442 A1

Research Grants

As Lead PI:

Weak 3D Cameras
NSF Small Core, 2025-2028
Co-PIs: None
Total Funding: $600K

Quanta Sensing for Next Generation Quantum Computing
UW Research Forward (UW Internal) Award, 2024-2026
Co-PIs: Mark Saffman (Physics), Swamit Tannu (CS), Andreas Velten (BMI/ECE)
Total Funding: $500K

Material Probes
ONR, 2024-2027
Co-PIs: Shree Nayar (Columbia University)
Total Funding: $900K; Gupta's Share: $450K

How many Photons are needed to Recognize an Object?
SONY Faculty Innovation Awards, 2020-2025
Co-PIs: None
Total Funding: $510K

Quanta Computational Imaging with Single-Photon Cameras
NSF CAREER Award, 2020-2025
Co-PIs: None
Total Funding: $550K

Analysis of Single-Photon Sensors for Long-range 3D Imaging
Cruise LLC, 2023-2024
Co-PIs: None
Total Funding: $125K

Practical Single-Photon 3D Imaging
WARF (UW-Madison IP Office), 2020-2024
Co-PIs: None
Total Funding: $325K

Next Generation Time-of-Flight Imaging
ONR, 2016-2019
Co-PIs: Shree Nayar (Columbia University)
Total Funding: $650K; Gupta's Share: $450K

Time-of-Flight Cameras
Sony Corp. (Research Gift), 2017-2018
Co-PIs: None
Total Funding: $70K

Hierarchical Visual Codes
Snap Research (Research Gift), 2020
Co-PIs: None
Total Funding: $20K

Practical Time-of-Flight Imaging
Draper Technology Innovation Fund (UW Internal) Award, 2020-2021
Co-PIs: None
Total Funding: $50K

Weak 3D Cameras
UW Internal Fall Competition, 2021-2022
Co-PIs: None
Total Funding: $40K

Single-Photon 3D Imaging
UW Internal Fall Competition, 2019-2020
Co-PIs: None
Total Funding: $40K

From One Photon to a Billion: Extreme Dynamic Range Imaging with Single Photon Sensors
Draper Technology Innovation Fund (UW Internal) Award, 2018-2019
Co-PIs: Andreas Velten (U. Wisconsin)
Total Funding: $50K; Gupta's Share: $25K

Extreme Motion Cameras
UW Internal Fall Competition, 2018-2019
Co-PIs: None
Total Funding: $40K

As Co-PI:

Scene Recovery Using an Extended Plenoptic Function
DARPA, 2016-2020
PIs: Srinivasa Narasimhan (CMU) and Andreas Velten (U. Wisconsin)
Total funding: ∼$5.5 million; Gupta's share: ∼$850K

Characterization, Mitigation, and Management of Active 3D Camera Interference
NSF CNS Medium Core, 2021-2025
PI: Suman Banerjee (U. Wisconsin)
Total funding: $1 million; Gupta's share: ∼$350K

Supporting Distributed Machine Learning Applications for the Nomadic Edge
NSF and Intel Research, 2020-2023
PI: Suman Banerjee (U. Wisconsin)
Total funding: $900K; Gupta's share: ∼$150K

Teaching

A summary of end-of-semester teaching evaluations, based on the following questions:

- **Q1: Did the instructor create a positive, engaging learning environment?** Range of Available Responses (1–7); 1 - Not at all; 4 - Neutral; 7 - Completely

- **Q2: Would you recommend this course to your fellow students?** Range of Available Responses (1–7); 1 - Not at all; 4 - Neutral; 7 - Completely
- **Q3: Would you recommend this instructor to your fellow students?** Range of Available Responses (1–7); 1 - Not at all; 4 - Neutral; 7 - Completely

Table 1: Summary of teaching evaluations at U. Wisconsin-Madison. The numerical values in the Q1, Q2 and Q3 columns indicate the mean values aggregated over the student responses to the corresponding survey question.

Semester	Course	Number of Students	Q1	Q2	Q3
Spring 2021	Graduate Computer Vision	70	6.22	5.88	6.12
Fall 2020	Ugrad. Computer Vision	50	6.48	5.86	6.26
Spring 2020	Graduate Computer Vision	64	5.91	5.32	5.64
Spring 2019	Graduate Computer Vision	65	6.33	5.78	5.75
Fall 2018	Computational Photography	142	5.65	4.17	4.48
Spring 2018	Graduate Computer Vision	82	6.16	5.90	6.04
Spring 2017	Graduate Computer Vision	58	6.20	5.77	5.85
Spring 2016	Graduate Computer Vision	53	6.45	6.15	6.42

Keynote and Plenary Talks

Workshop on Computer Vision with Single-Photon Cameras, IEEE ICCV (2025)

Workshop on Visual Odometry and Applications, IEEE CVPR (2023)

SONY Distinguished Engineer Professor Lecture Series (2022)

Workshop on Computational Cameras and Displays, IEEE CVPR (2022)

International Conference on Quality Control by Artificial Vision (2017)

Workshop on Computational Cameras and Displays, IEEE CVPR (2014)

Invited Talks

Shedding Light on 3D Cameras. Carnegie Mellon University, Robotics Institute VASC Seminar (April 2024); NYU Courant Institute Computer Science Colloquium (October 2022); Magic Leap Seminar (September 2022); Cruise Seminar (March 2022); UC Berkeley (September 2021); Cornell University (October 2021); Google Research (October 2021)

A Coding Theory of 3D Cameras. Mathematics of Computer Vision, Joint Mathematics Meetings (January 2024); Georgia Tech. (September 2021)

Computational Imaging, One Photon at a Time. Image Sensors Workshop at IEEE Sensors (October 2025); IEEE ICCP (July 2025); Disney Research (August 2024); Snap Labs (July 2024); Meta Reality Labs (June 2024); University of Florida (April 2021); Stanford University SCIEN Seminar Series (October 2020)

Towards Next Generation 3D Cameras. Omron R&D Center, Kyoto, Japan (May 2017); SONY R&D Center, Atsugi, Tokyo, Japan (May 2017); Oculus Research, Seattle (March 2016); University of Washington, Seattle (June 2015); Amazon, Seattle (June 2015); Microsoft Research Labs, Seattle (June 2015); Robotics Institute, Carnegie Mellon University (April 2015); University of Wisconsin-Madison (December 2014)

Time-of-Flight Revolution. Dagstuhl Seminar on Computational Imaging (May 2015); Workshop on Comp. Photography and Intelligent Cameras, UCLA (February 2015); MIT Media Labs (November 2014)

Measuring 3D Shape When Light Misbehaves. University of Toronto (June 2011); Harvard University (June 2011)

Probing Scenes with Programmable Illumination. Intel Research Labs, Seattle (April 2010); UC Berkeley (June 2010); Columbia University (June 2010)

Scene Recovery in the presence of Global Light Transport. Stony Brook University (July 2009); Columbia University (July 2009)