

MOHIT GUPTA

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Research Interests

Computer Vision, Computational Imaging and Illumination

Education

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

Work Experience

Assistant Professor, University of Wisconsin-Madison Computer Science Department	2016 -
Post-doctoral Research Scientist, Columbia University Advisor: Prof. Shree K. Nayar	2011 - 2015
Intern, Mitsubishi Electric Research Labs Mentor: Dr. Amit Agrawal	Summer 2010, Summer 2009
Research Assistant, Carnegie Mellon University Advisor: Prof. Srinivasa G. Narasimhan	2005 - 2010

Awards and Honors

- Keynote Talk, Workshop on Computational Cameras and Displays, CVPR 2014**
June 2014
- Best Paper (Honorable Mention), International Conference on Computational Photography**
April 2014
- Best B. Tech Project in Computer Science (software category), I.I.T. Delhi**
June 2003

Publications

Book:

Throwing Light On Vision: An Introduction to Active Illumination Methods

Mohit Gupta and Shree Nayar

under preparation, tentative release date: December'2016

Journal Publications:

DisCo: Display-Camera Communication Using Rolling Shutter Sensors

Kensei Jo, Mohit Gupta and Shree Nayar

ACM Transactions on Graphics (ACM TOG 2016), presented at SIGGRAPH 2016

Phasor Imaging: A Generalization of Correlation Based Time-of-Flight Imaging

Mohit Gupta, Shree Nayar, Matthias Hullin and Jaime Martin

ACM Transactions on Graphics (ACM TOG 2015), presented at SIGGRAPH 2015

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 (TPAMI 2013)

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)

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)

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)

Acquiring Scattering Properties of Participating Media by Dilution

Srinivasa Narasimhan, Mohit Gupta, Craig Donner, Ravi Ramamoorthi, Shree Nayar, Henrik Wann Jensen

ACM Transactions on Graphics (SIGGRAPH 2006)

Refereed Conference Publications:

Dual Structured Light 3D using a 1D Sensor

Jian Wang, Aswin Sankaranarayanan, Mohit Gupta and Srinivasa Narasimhan
European Conference on Computer Vision (ECCV 2016)

SpeDo: 6 DOF Ego-Motion Sensor Using Speckle Defocus Imaging

Kensei Jo, Mohit Gupta and Shree Nayar
IEEE International Conference on Computer Vision (ICCV 2015)

LiSens: A Scalable Architecture for Video Compressive Sensing

Jian Wang, Mohit Gupta and Aswin Sankaranarayanan
IEEE International Conference on Computational Photography (ICCP 2015)

MC3D: Motion Contrast 3D Scanning

Nathan Matsuda, Oliver Cossairt and Mohit Gupta
IEEE International Conference on Computational Photography (ICCP 2015)

Digital Refocusing with Incoherent Holography

Oliver Cossairt, Nathan Matsuda and Mohit Gupta
IEEE International Conference on Computational Photography (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
European Conference on Computer Vision (ECCV 2014)

Fibonacci Exposure Bracketing for High Dynamic Range Imaging

Mohit Gupta, Daisuke Iso and Shree Nayar
IEEE International Conference on Computer Vision (ICCV 2013)

Structured Light in Sunlight

Mohit Gupta, Qi Yin and Shree Nayar
IEEE International Conference on Computer Vision (ICCV 2013)

Micro Phase Shifting

Mohit Gupta and Shree Nayar
IEEE Computer Vision and Pattern Recognition (CVPR 2012)

Diffuse Structured Light

Shree Nayar and Mohit Gupta
IEEE International Conference on Computational Photography (ICCP 2012)

Video from a Single Exposure Coded Photograph using a Learned Over-Complete Dictionary

Yasunobu Hitomi, Jinwei Gu, Mohit Gupta and Shree Nayar
IEEE International Conference on Computer Vision (ICCV 2011)

Multiplexed Illumination for Scene Recovery in the Presence of Global Illumination

Jinwei Gu, Toshihiro Kobayashi, Mohit Gupta and Shree Nayar
IEEE International Conference on Computer Vision (ICCV 2011)

Structured Light 3D Scanning Under Global Illumination

Mohit Gupta, Amit Agrawal, Ashok Veeraraghavan and Srinivasa Narasimhan
IEEE Computer Vision and Pattern Recognition (CVPR 2011)

Flexible Voxels for Motion-Aware Videography

Mohit Gupta, Amit Agrawal, Ashok Veeraraghavan and Srinivasa Narasimhan
European Conference on Computer Vision (ECCV 2010)

Optimal Coded Sampling for Temporal Super-Resolution

Amit Agrawal, Mohit Gupta, Ashok Veeraraghavan and Srinivasa Narasimhan
IEEE Computer Vision and Pattern Recognition (CVPR 2010)

(De) Focusing on Global Light Transport for Active Scene Recovery

Mohit Gupta, Yuandong Tian, Srinivasa Narasimhan and Li Zhang
IEEE Computer Vision and Pattern Recognition (CVPR 2009)

On Controlling Light Transport in Poor Visibility Environments

Mohit Gupta, Srinivasa Narasimhan and Yoav Schechner
IEEE Computer Vision and Pattern Recognition (CVPR 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)

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 International Conference on Computer Vision (ICCV 2005)

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:

Shape From Scatter

Mohit Gupta
Computer Vision: A Reference Guide, 2014, Publisher: Springer

Performance Limits for Motion Deblurring Cameras

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

Patents and Applications

Systems, methods, and media for performing shape measurement

Related paper: Micro Phase Shifting

Publication number WO2013078349 A1

* **Licensed**

Methods, systems, and media for high dynamic range imaging

Related paper: Fibonacci exposure bracketing for HDR imaging

Publication number WO2014099320 A1

Video Camera for Acquiring Images with Varying Spatio-Temporal Resolutions

Related paper: Flexible voxels for motion-aware videography

Publication number US20110243442 A1

Talks

Towards Next Generation 3D Cameras

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 Computational Photography and Intelligent Cameras, UCLA (February 2015)

MIT Media Labs (November 2014)

Keynote talk, CCD Workshop at IEEE CVPR (June 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)

University of California, 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)

Professional Activities

Program Committees

Demos and Posters Chair for IEEE ICCP 2016

Program committee member for SIGGRAPH Asia 2015 posters and technical briefs

Tutorial Organization

Co-organized tutorial on time-of-flight (ToF) imaging at ICCV 2015

Co-organized tutorial on computational imaging at ICIP 2015

Co-organized tutorial on compressive sensing of videos at CVPR 2012

Co-organized the symposium on volumetric scattering at CVPR 2007

Reviewing

Reviewer for Science, SIGGRAPH, SIGGRAPH Asia, PAMI, IJCV, TIP, ICCV, CVPR, ECCV, ICCP