# Sudipta N. Sinha

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## Education

- **University of North Carolina**, Chapel Hill, USA
  Ph.D. in Computer Science, August 2009
  - Thesis: Silhouettes for calibration and reconstruction from multiple views
  - Advisor: Prof. Marc Pollefeys

  M.S. in Computer Science, May 2005
- **Indian Institute of Technology**, Kanpur, India
  Bachelor of Technology in Computer Science and Engineering, May 2000.

## Experience

- **Researcher**, Microsoft Research, Redmond — Nov 09 – present
  My research interests are in computer vision, robotics, machine learning and computer graphics. I work on 3D reconstruction from images and video and specifically on structure from motion, stereo, scene flow, visual odometry, image-based localization, object detection and augmented reality. I collaborate with product teams on 3D vision technologies and have contributed to Microsoft Photosynth, Microsoft Hyperlapse Pro and Microsoft HoloLens.
- **Postdoctoral Researcher**, Microsoft Research, Redmond — Oct 08 – Nov 09
  Developed new stereo matching and 3D computer vision techniques.
- **Visiting Scholar**, Institute for Visual Computing, ETH Zurich — May 08 – Jun 08
- **Research Assistant**, Computer Science Dept., UNC Chapel Hill — Aug 02 – Aug 08
  Worked on camera network calibration and synchronization, active pan-tilt zoom cameras, dense 3D scene reconstruction and real-time computer vision on GPUs.
- **Research intern**, Microsoft Live Labs, Redmond — Jun 07 – Aug 07
  Developed an interactive system for sketch-based 3D modeling from images.
- **Research intern**, Siemens Corporate Research, Princeton — Jun 05 – Aug 05
  Implemented a new method for efficient SIFT feature extraction on GPUs.
- **Research intern**, Siemens Corporate Research, Princeton — May 04 – Jul 04
  Investigated active Pan-Tilt-Zoom camera calibration and image stitching.
- **Systems Analyst**, Deloitte Consulting, New York — Oct 00 – Apr 02
  Wrote middleware software for financial trading systems.
- **Intern**, Institute for Informatik, Univerity of Zurich, — Jul 00 – Sep 00
  Developed a web-based distance learning software platform.
- **Intern**, Computer Graphics Lab, EPFL, Lausanne, — May 99 – Jul 99
  Developed a networking library for distributed virtual environments.

## Teaching

- **Speaker**, 3rd Summer School on Computer Vision — Jul 2018
  Basics OF Modern AI, IIIT Hyderabad, India.
- **Tutorial** Computer Vision on Microsoft HoloLens — Sep 2017
  IROS 2017 conference tutorial (with M. Pollefeys and others).

- ◇ **Tutorial** Computer Vision on Microsoft HoloLens — Jul 2017
  CVPR 2017 conference tutorial (with M. Pollefeys and others).
- ◇ **Tutorial** on Geometric and Semantic 3D Reconstruction — Jul 2017
  CVPR 2017 conference tutorial (with C. Haene, J. Engels and S. Ramalingam).
- ◇ **Tutorial** on Structured and Semantic 3D Modeling — Oct 2016
  3DV 2016 conference tutorial (with C. Haene and S. Ramalingam).
- ◇ **Instructor**, Introduction to Scientific Programming (Comp116) — Aug – Dec 2006
  Taught a full semester undergraduate class of 32 students.

## Honors

- ◇ Outstanding Reviewer, European Conference on Computer Vision (ECCV), 2016.
- ◇ Outstanding Reviewer, Asian Conference on Computer Vision (ACCV), 2014.
- ◇ Outstanding Reviewer, IEEE Conf. on Computer Vision & Pattern Recognition (CVPR) 2013.
- ◇ Outstanding Reviewer, Asian Conference on Computer Vision (ACCV), 2010.
- ◇ Best Demo Award, IEEE Conf. on Computer Vision & Pattern Recognition (CVPR) 2007, member of the *Urbanscape* team from UNC Chapel Hill.
- ◇ Recipient of the National Talent Scholarship, India, 1994 – 2000.

## Journal Papers

- ◇ G. Ananthanarayanan, P. Bahl, P. Bodk, K. Chintalapudi, M. Philipose, L. Ravindranath and S.N. Sinha, "Real-Time Video Analytics: The Killer App for Edge Computing", Vol. 50 (10), (**IEEE Computer**), DOI: 10.1109/MC.2017.3641638, October 2017.
- ◇ S. You, Y. Matsushita, S. N. Sinha, Y. Bou, K. Ikeuchi, "Multiview Rectification of Folded Documents", IEEE Transactions on Pattern Analysis and Machine Intelligence, (**TPAMI**), DOI: 10.1109/TPAMI.2017.2675980, February 2017.
- ◇ J. Park, S. N. Sinha, Y. Matsushita, Y. W. Tai, I. S. Kweon, "Robust Multiview Photometric Stereo using Planar Mesh Parameterization", IEEE Transactions on Pattern Analysis and Machine Intelligence, (**TPAMI**), DOI: 10.1109/TPAMI.2016.2608944, September 2016.
- ◇ H. Lim, S. N. Sinha, M.F. Cohen, M. Uyttendaele and H. Jin Kim, "Real-time monocular image-based 6-DoF localization", International Journal of Robotics Research, (**IJRR**), 34(4-5): pp. 476–492 (2015).
- ◇ S. N. Sinha, J.-M.Frahm, M. Pollefeys and Y. Genc, "Feature Tracking and Matching in Video Using Programmable Graphics Hardware", Machine Vision and Applications, (**MVA**), 22(1): pp. 207–217 (2011).
- ◇ S. N. Sinha and M. Pollefeys, "Camera Network Calibration and Synchronization from Silhouettes in Archived Video", International Journal of Computer Vision, (**IJCV**), 87(3): pp. 266–283 (2010)
- ◇ M. Pollefeys, D. Nister, J.-M. Frahm, A. Akbarzadeh, P. Mordohai, B. Clipp, C. Engels, D. Gallup, S.-J. Kim, P. Merrell, C. Salmi, S. N. Sinha, B. Talton, L. Wang, Q. Yang, H. Stewnius, R. Yang, G. Welch, H. Towles, "Detailed Real-Time Urban 3D Reconstruction from Video", International Journal of Computer Vision, (**IJCV**), 78(2-3): pp. 143–167 (2008).
- ◇ S. N. Sinha and M. Pollefeys, "Pan-Tilt-Zoom Camera Calibration and High-Resolution Mosaic Generation", Computer Vision and Image Understanding, (**CVIU**), Special issue on Omnidirectional Vision and Camera Networks, 103(3): pp. 170–183, (2006).

## Conference Papers

- ◇ F. Pittaluga, S.J. Koppal, S.B. Kang and S.N. Sinha, "Revealing Scenes by Inverting Structure from Motion Reconstructions", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2019 (to appear).

- P. Speciale, J. Schoenberger, S.B. Kang, S.N. Sinha and M. Pollefeys, "Privacy Preserving Image-based Localization", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2019 (to appear).
- J. Schoenberger, S.N. Sinha and M. Pollefeys, "Learning to Fuse Proposals from Multiple Scanline Optimizations in Semi-Global Matching", *European Conference on Computer Vision* (**ECCV**), 2018.
- B. Hepp, D. Dey, S.N. Sinha, A. Kapoor, N. Joshi and O. Hilliges, "Learn-to-Score: Efficient 3D Scene Exploration by Predicting View Utility", *European Conference on Computer Vision* (**ECCV**), 2018.
- J. Dong, B. Boots, F. Dellaert, R. Chandra and S.N. Sinha, "Learning to Align Images using Weak Geometric Supervision", *International Conference on 3D Vision* (**3DV**), 2018.
- B. Tekin, S.N. Sinha and P. Fua, "Real-Time Seamless Single Shot 6D Object Pose Prediction", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2018.
- M. Roberts, D. Dey, A. Truong, S.N. Sinha, S. Shah, A. Kapoor, P. Hanrahan, N. Joshi, "Submodular Trajectory Optimization for Aerial 3D Scanning", *IEEE International Conference on Computer Vision* (**ICCV**), 2017.
- D. Scharstein, T. Taniai and S.N. Sinha, "Semi-Global Stereo Matching with Surface Orientation Priors", *International Conference on 3D Vision* (**3DV**), 2017.
- A. Rozantsev, S. N. Sinha, D. Dey and P. Fua, "Flight Dynamics-based Recovery of a UAV Trajectory using Ground Cameras", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2017.
- T. Taniai, S. N. Sinha and Y. Sato, "Fast Multi-frame Stereo Scene Flow with Motion Segmentation", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2017.

- D. Vasisht, Z. Kapetanovic, J. Won, X. Jin, R. Chandra, A. Kapoor, S. N. Sinha, M. Sudarshan and S. Stratman, "FarmBeats: An IoT Platform for Data-Driven Agriculture", *14th USENIX Symposium on Networked Systems Design and Implementation* (**NSDI**), 2017.
- J. Park, Y. W. Tai, S. N. Sinha and I. S. Kweon, "Efficient and Robust Color Consistency for Community Photo Collections", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2016.
- T. Taniai, S. N. Sinha and Y. Sato, "Joint Recovery of Dense Correspondence and Cosegmentation in Two Images", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2016.
- H. Lim and S. N. Sinha, "Monocular Localization of a Moving Person Onboard a Quadrotor MAV", *IEEE International Conference on Robotics and Automation* (**ICRA**), 2015.
- J. Park, S. N. Sinha, Y. Matsushita, Y. W. Tai, I. S. Kweon, "Calibrating a non-isotropic near point light source using a plane", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2014.
- S. N. Sinha, D. Scharstein and R. Szeliski, "Efficient High-Resolution Stereo Matching using Local Plane Sweeps", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2014.
- K. Ramnath, S. Baker, L. Vanderwende, M. El-Saban, S. N. Sinha, A. Kannan, N. Hassan, M. Galley, Y. Yang, D. Ramanan, A. Bergamo and L. Torresani, "AutoCaption: Automatic Caption Generation for Personal Photos", *IEEE Winter Conference on Applications of Computer Vision* (**WACV**), 2014.

- K. Ramnath, S. N. Sinha, R. Szeliski and E. Hsiao, "Car make and model recognition using 3d curve alignment", *IEEE Winter Conference on Applications of Computer Vision* (**WACV**), 2014.
- J. Park, S. N. Sinha, Y. Matsushita, Y.W. Tai, I.S. Kweon, "Multiview Photometric Stereo using Planar Mesh Parameterization", *IEEE International Conference on Computer Vision* (**ICCV**), 2013.
- A. Bergamo, S. N. Sinha and L. Torresani, "Leveraging Structure from Motion to Learn Discriminative Codebooks for Scalable Landmark Classification", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2013.
- A. Kowdle, S. N. Sinha and R. Szeliski, "Multiple View Object Cosegmentation using Appearance and Stereo Cues", *European Conference on Computer Vision* (**ECCV**), 2012.
- S. N. Sinha, K. Ramnath and R. Szeliski, "Detecting and Reconstructing 3D Mirror Symmetric Objects", *European Conference on Computer Vision* (**ECCV**), 2012.
- S. N. Sinha, J. Kopf, M. Goesele, D. Scharstein and R. Szeliski, "Image-Based Rendering for Scenes with Reflections", *ACM Transactions on Graphics* (**SIGGRAPH**), 31(4), 2012.
- H. Lim, S. N. Sinha, M. Cohen and M. Uyttendaele, "Real-time Image-based 6-DOF Localization in Large-Scale Environments", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2012.
- A. Cohen, C. Zach, S. N. Sinha and M. Pollefeys, "Discovering and exploiting 3D symmetries in structure from motion", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2012.
- R. Roberts, S. N. Sinha, R. Szeliski and D. Steedly, "Structure from motion for scenes with large duplicate structures", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2011.
- M. Bleyer, C. Rother, P. Kohli, D. Scharstein and S. N. Sinha, "Object Stereo - Joint Stereo Matching and Object Segmentation", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2011.
- K. Srijan, S. Ahsan, S. N. Sinha and C.V. Jawahar, "Image-based walkthroughs from incremental and partial scene reconstructions", *British Machine Vision Conference* (**BMVC**), 2010.
- S. N. Sinha, D. Steedly and R. Szeliski, "Piecewise Planar Stereo for Image-based Rendering", *IEEE International Conference on Computer Vision* (**ICCV**), 2009.
- S. N. Sinha, D. Steedly, R. Szeliskli, M. Agarwala and M. Pollefeys, "Interactive 3D Architectural Modeling from Unordered Photo Collections", *ACM Transactions on Graphics*, (**SIGGRAPH Asia**), 27(5), 2008.
- S. N. Sinha, P. Mordohai and M. Pollefeys, "Multi-View Stereo via Graph Cuts on the Dual of an Adaptive Tetrahedral Mesh", *International Conference on Computer Vision* (**ICCV**), 2007.
- L. Guan, S. N. Sinha, J. S. Franco and M. Pollefeys, "Visual Hull Construction in the Presence of Partial Occlusion", *International Symposium on 3D Data Processing, Visualization and Transmission* (**3DPVT**), 2006.
- A. Akbarzadeh, J.-M. Frahm, P. Mordohai, B. Clipp, C. Engels, D. Gallup, P. Merrell, M. Phelps, S. N. Sinha, B. Talton, L. Wang, Q. Yang, H. Stewenius, R. Yang, G. Welch, H. Towles, D. Nister and M. Pollefeys, "Towards Urban 3D Reconstruction From Video", *International Symposium on 3D Data Processing, Visualization and Transmission* (**3DPVT**), 2006.
- S. N. Sinha and M. Pollefeys, "Multi-view Reconstruction using Photo-consistency and Exact Silhouette Constraints: A Maximum-Flow Formulation", *IEEE International Conference on Computer Vision* (**ICCV**), 2005.

- S. N. Sinha M. Pollefeys and S.J. Kim, "High Resolution Multiscale Panoramic Mosaics from Pan-Tilt-Zoom Cameras", *Indian Conf. on Vision, Graphics & Image Processing* (**ICVGIP**), 2004.
- S. N. Sinha and M. Pollefeys, "Visual-Hull Reconstruction from Uncalibrated and Unsynchronized Video Streams", *International Symposium on 3D Data Processing, Visualization and Transmission* (**3DPVT**), 2004.
- S. N. Sinha and M. Pollefeys, "Calibrating a network of cameras from live or archived video", *Advanced Concepts for Intelligent Systems* (**ACIVS**), 2004.
- S. N. Sinha and M. Pollefeys, "Synchronization and Calibration of Camera Networks from Silhouettes", *International Conference on Pattern Recognition* (**ICPR**), 2004.
- M. Pollefeys and S. N. Sinha, "Iso-disparity surfaces for general stereo configurations", *European Conference on Computer Vision* (**ECCV**), 2004.
- S. N. Sinha, M. Pollefeys and L. McMillan, "Camera Network Calibration from Dynamic Silhouettes", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2004.
- N. Kelshikar, X. Zabulis, K. Daniilidis, V. Sawant, S. N. Sinha, T. Sparks, S. Larsen, H. Towles, K. M.-Patel, H. Fuchs, J. Urbanic, K. Benninger, R. Reddy, and G. Huntoon, "Real-time Terascale Impementation of Tele-immersion," *International Conference on Computational Science* (**ICCS**), 2003.
- S. Paul, S. N. Sinha and A. Mukerjee, "Virtual Kathakali: Gesture Driven Metamorphosis", *International Conference on Knowledge Based Computer Systems* (**KBCS**), 1998.

## Workshop Papers

- Z. Wang, V. Vineet, F. Pittaluga, S.N. Sinha, O. Cossairt, S.B. Kang, "Privacy-Preserving Action Recognition using Coded Aperture Videos", *Workshop on Challenges and Opportunities for Privacy and Security (CV-COPS)*, CVPR Workshop, 2019.
- V. Hedau, S. N. Sinha, C. L. Zitnick and R. Szeliski, "A Memory Efficient Discriminative approach for Location aided Recognition", *Workshop on Visual Analysis and Geo-Localization of Large-Scale Imagery*, (ECCV Workshop), 2012.
- H. Lim and S. N. Sinha, "Towards Real-Time Semantic Localization", *Workshop on Semantic Perception and Mapping*, (ICRA Workshop), 2012.
- S. N. Sinha, D. Steedly and R. Szeliski, "A multi-stage linear approach to structure from motion", *Workshop on Reconstruction and Modeling of Large-Scale 3D Virtual Environments*, (ECCV Workshop), 2010.
- S. N. Sinha, J.-M. Frahm, M. Pollefeys and Y. Genc, "GPU-based Video Feature Tracking and Matching", *Workshop on Edge Computing using New Commodity Architectures*, (EDGE), Chapel Hill, 2006.
- S. N. Sinha and M. Pollefeys, "Towards Calibrating a Pan-Tilt-Zoom Camera Network", *Workshop on Omnidirectional Vision and Camera Networks*, (OMNIVIS), 2004.
- H. Towles, S.U. Kum, T. Sparks, S. N. Sinha, S. Larsen and N. Beddes, "Transport and Rendering Challenges of Multi-Stream 3D Tele-Immersion Data", *Workshop on Collaborative Virtual Reality and Visualization* (CVRV), 2003.

## Book Chapters

- S. N. Sinha, V. Hedau, C. L. Zitnick and R. Szeliski, "A Memory Efficient Discriminative Approach for Location-Aided Recognition", *Visual Analysis and Geo-Localization of Large Scale Imagery*, Springer, 2016 (expected).

- S. N. Sinha, "Multiview stereo", *Encyclopedia of Computer Vision*, K. Ikeuchi, M. Hebert and L. Quan (Eds.), Springer, 2014.
- S. N. Sinha, "Pan/Tilt/Zoom (PTZ) camera setup", *Encyclopedia of Computer Vision*, K. Ikeuchi, M. Hebert and L. Quan (Eds.), Springer, 2014.
- M. Pollefeys, S. N. Sinha, L. Guan, J.-S. Franco, "Multiview Calibration Synchronization and Dynamic Scene Reconstruction", *Multi-Camera Networks: Principles and Applications*, H. Aghajan and A. Cavallaro (Eds.), ELSEVIER, May 2009, ISBN-13: 978-0-12-374633-7.
- M. Pollefeys, S. N. Sinha and J. Yan, "Calibration and Shape Recovery from Videos of Dynamic Scenes", *Computational Vision in Neural and Machine Systems,* L. Harris and M. Jenkins (Eds.), Cambridge University Press, 2007.

PATENTS

- "Camera Pose Estimation using Obfuscated Features", with M. Pollefeys and P. Speciale and S.B. Kang, *submitted (2018).*
- "Device Pose Estimation using 3D Line Clouds", with M. Pollefeys and P. Speciale and S.B. Kang, *submitted (2018).*
- "Scene reconstruction from bursts of image data", with N. Joshi and M.P. Vo, *Patent No. 20180225836.*
- "IoT Gateway For Weakly Connected Settings", with R. Chandra and others, *Patent No. 20190007505.*
- "Aerial imaging of a region using above ground aerial camera platform", with R. Chandra and others, *Patent No. 20180213187.*
- "Low-cost, long-term aerial imagery", with R. Chandra and others, *Patent No. 20180213186.*
- "Generating Real-Time Sensor Maps From Videos And In-Ground Sensor Data", with R. Chandra and others, *Patent No. 10089716.*
- "Polarized gaze tracking", with V. Thukral, V. Pradeep and others, *Patent App. 14/191305.*
- "Panorama Packet", with B. Arcas, M. Unger, E. J. Stollnitz and others, *Patent App. 13/804895.*
- "Image capture and ordering", with B. Arcas, M. Unger and others, *Patent App. 13/826091.*
- "Synth Packet For Interactive View Navigation Of A Scene", with M. Unger, B. Arcas, R. Szeliski and M. Uyttendaele, *Patent App. 13/826423.*
- "Translated View Navigation For Visualizations", with M. Unger, B. Arcas, D. Barnett, C. Messer, E. Stollnitz, T. Pylvaenaeinen, *Patent App. 13/804543.*
- "Object identification using 3-d curve matching", with E. Hsiao, K. Ramnath, S. Baker, C. L. Zitnick and R. Szeliski, *US Patent 9111349 B2, August 2015.*
- "Location-aided Recognition", with V. Hedau, C. L. Zitnick and R. Szeliski, *US Patent 9152882 B2, October 2015.*
- "Three Dimensional Object Browsing in Documents", with J. Kopf, E. Stollnitz, G. Zweig and R. Szeliski, *US Patent 9025860 B2, February 2015.*
- "Navigation Model To Render Centered Objects Using Images", with J. Kopf, E. Stollnitz and R. Szeliski, *US Patent 8675049, March 2014.*
- "Image Based Localization", with H. Lim, M. Cohen and M. Uyttendaele, *US Patent 8798357 B2, August, 2014.*
- "Performing Structure from Motion for Unordered Images Of a Scene With Multiple Object Instances", with R. Roberts, R. Szeliski and D. Steedly, *US Patent 8620095, December 2013.*
- "Multi-stage Linear Structure from Motion", with D. Steedly and R. Szeliski, *US Patent 8837811, September 2014.*
- "Piecewise Planar Rendering Of Three-Dimensional Scenes", with D. Steedly and R. Szeliskli, *US Patent 8933925, January 2015.*

◇ "Using Photo Collections for Three Dimensional Modeling", with D. Steedly, R. Szeliski and M. Agarwala, *US Patent 9001120, April 2015.*

UNREFEREED ARTICLES

◇ S. N. Sinha, "Calibration of a heterogeneous network of color and depth cameras", *Canesta Design Contest (Phase I)* winner, January 2005.

◇ S. N. Sinha, "Graph Cut Algorithms in Vision, Graphics and Machine Learning", *Research survey paper*, UNC Chapel Hill, December, 2004.

PROFESSIONAL ACTIVITIES

◇ **Advising:**

J. DeGol, Univ. of Illinois Urbana-Champaign (UIUC), Ph.D. dissertation committee member.

J. Dong, Georgia Tech, Ph.D. dissertation committee member.

B. Tekin, Ecole polytechnique federale de Lausanne (EPFL), Ph.D. committee member.

◇ **General:**

Area Editor, Computer Vision and Image Understanding (CVIU) Journal, 2018 –.

Area Chair, International Conference on 3D Vision (3DV), 2019.

Area Chair, International Conference on 3D Vision (3DV), 2018.

Program Co-chair "International Conference on 3D Vision (3DV)", 2017.

Co-organizer "Special Session on Geometry and Optimization in Computer Vision", American Mathematical Society (AMS) Spring Sectional Meeting, 2017.

Area Chair, International Conference on Computer Vision (ICCV), 2017.

Area Chair, International Conference on 3D Vision (3DV), 2016.

Industry and Demo Chair, 3rd Joint 3DIM/3DPVT Conference (3DV 2013).

◇ **Conference Program Committee Member:**

ACM Multimedia Conference 2016.

Conference on Artificial Intelligence (AAAI) 2018.

British Machine Vision Conference (BMVC) 2017, 2018, 2019.

IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2009–2019.

3D Processing, Visualization and Transmission (3DPVT 2012, 3DV 2013, 2014, 2015).

Asian Conference on Computer Vision (ACCV) 2009, 2010, 2012, 2014, 2016.

European Conference on Computer Vision (ECCV) 2008, 2010, 2012, 2014, 2016, 2018.

IEEE International Conference on Computer Vision (ICCV) 2009, 2011, 2013, 2015, 2019.

Indian Conference on Vision, Graphics and Image Processing (ICVGIP) 2010, 2012, 2014, 2016.

Conf. on Computer Vision, Pattern Recognition, Image Proc.& Graphics(NCVPRIPG 2011).

◇ **Workshop Program Committee Member:**

Workshop on Performance Metrics for Correspondence Problems (CVPR 2015).

Ground Truth - What is a good dataset ? (CVPR 2013 Workshop).

Workshop on Unsolved Problems in Optic Flow and Stereo Estimation (ECCV 2012).

Consumer Depth Cameras for Computer Vision (ECCV 2012 Workshop).

Vision and Graphics Computing for Multimedia Communications (ICME 2011 Workshop).

Reconstruction and Modeling of Large-Scale 3D Virtual Environments (ECCV 2010 Workshop).

Computer Vision on GPUs (CV-GPU) (ECCV 2010 Workshop).

Dynamic 3D Imaging (DAGM 2009 Workshop).

Time of Flight Camera based Computer Vision (TOF–CV), (CVPR 2008 Workshop).

◇ **Conference Reviewer:**

CVPR 2006–08, ICCV 2007, ECCV 2006, WACV 2008, SIGGRAPH 2008–14, 2017–19, SIGGRAPH Asia 2009–12, 2016–2018, EuroGraphics 2012, 2014–16, ICRA 2015–16, IROS 2016.

◇ **Journal Reviewer**

ACM Transaction on Graphics (ToG),

International Journal of Computer Vision (IJCV),

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI),

IEEE Transactions on Visualization and Computer Graphics (TVCG),

IEEE Transactions of Computational Imaging (TCI),

IEEE IEEE Transactions on Multimedia (TMM),

Computer Vision and Image Understanding (CVIU),

Journal of Visual Communication and Image Representation (JVCI),

Machine Vision and Applications (MVA),

Image and Visual Computing (IVC).

IEEE Pervasive Computing.

Optics Express.

IEEE Signal Processing Letters.

## Invited Talks

◇ *Recovering Image Correspondence: New Methods and Applications*, Shonan meeting on Optimization Methods in Geometric Vision, NII Shonan, January 2019.

◇ *Recent Progress in Stereo, Scene Flow and Object Pose Estimation*, Georgia Tech, August 2018.

◇ *Efficient and Accurate 3D Scene Reconstruction and Object Pose Prediction*, University of Urbana Champaign, May 2018.

◇ *FarmBeats: AI and IoT for Agriculture*, (with R. Chandra), Computational Sustainability Virtual Seminar, February 2018.

◇ *Flexible priors for robust dense stereo matching*, International Workshop on Lines, Planes and Manhattan Models for 3-D Mapping (LPM 2017), IROS workshop, September 2017.

◇ *Towards exploiting image correspondence for weakly supervised visual recognition*, Microsoft Research Asia Faculty Summit, Yonsei University, November 2016.

◇ *Correspondence Estimation in Images: New Techniques and Applications*, GRAIL seminar, University of Washington, Seattle, April 2016.

◇ *Efficient high-resolution stereo matching using local plane sweeps*, CVPR Workshop on Registration of Very Large Images, June 2014.

◇ *Recent work in image-based rendering from unstructured image collections and remaining challenges*, Dynamic Maps Dagstuhl Seminar, September 2010.

◇ *Parallel Computer Vision Algorithms*, (with Rick Szeliski and Sameer Agarwal), UPCRC Multicore Applications Workshop, Microsoft Research, May 2009.

◇ *Multi-view approaches for camera calibration and image-based modeling*, Candidate Talk, Microsoft Research, April 2008.

◇ *Silhouettes for calibration and reconstruction from multiple views*, Indian Institute of Information Technology, (IIIT) Hyderabad, April 2007.

- ◇ *Computer Vision using GPUs*, Guest lecture, UNC Chapel Hill, February 2007.
- ◇ *Feature tracking and matching*, Guest lecture, UNC Chapel Hill, August 2006.
- ◇ *Graph Cuts for Discrete Optimization*, Guest lecture, UNC Chapel Hill, April 2005.

SOFTWARE

- ◇ GPU-KLT: GPU-based real-time Kanade-Lukas-Tomasi (KLT) Feature Tracking; open source C++ library. (approx. 2500+ downloads between July 2006 – August 2009).