

Kalyan Sunkavalli

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EDUCATION

Harvard University, Cambridge, MA
Ph.D., Computer Science, May 2012
Advisor: Hanspeter Pfister
Thesis: Models of Visual Appearance for Analyzing and Editing Images and Videos

Columbia University, New York, NY
M.S., Computer Science, May 2006
Advisor: Ravi Ramamoorthi

Indian Institute of Technology, New Delhi, India
B. Tech., Electrical Engineering, May 2003

WORK EXPERIENCE

Adobe Research, San Jose, CA
Senior Research Scientist, Sept 2016 – present
Research Scientist, Jul 2012 – Aug 2016

Microsoft Research, Interactive Visual Media Group, Redmond, WA
Research Intern, May – Aug 2009

Adobe, Creative Technologies Lab, Newton, MA
Research Intern, May – Sep 2008

Mitsubishi Electric Research Labs, Cambridge, MA
Research Intern, Aug 2006 – Jul 2007

Talisma Corporation, Bangalore, India
Software Development Engineer, Jun 2003 – Jun 2004

PUBLICATIONS

Journal Publications

- [1] Deep Image-based Relighting using Optimal Sparse Samples
Zexiang Xu, **Kalyan Sunkavalli**, Sunil Hadap, and Ravi Ramamoorthi
ACM Transactions on Graphics (Proc. SIGGRAPH), 2018, *conditionally accepted*
- [2] Learning to Predict Indoor Illumination from a Single Image
Marc-Andre Gardner, **Kalyan Sunkavalli**, Ersin Yumer, Xiaohui Shen, Emiliano Gambaretto, Christian Gagné, and Jean-François Lalonde
ACM Transactions on Graphics (Proc. SIGGRAPH Asia), 2017
- [3] Photometric Stabilization for Fast-forward Videos
Xuaner Zhang, Joon-Young Lee, **Kalyan Sunkavalli**, and Zhaowen Wang
Computer Graphics Forum (Proc. Pacific Graphics), 2017

- [4] Nautilus: Recovering Regional Symmetry Transformations for Image Editing
Michal Lukáč, Daniel Sýkora, **Kalyan Sunkavalli**, Eli Shechtman, Ondřej Jamriška, Nathan Carr, and Tomáš Pajdla
ACM Transactions on Graphics (Proc. SIGGRAPH), 2017
- [5] Portrait Lighting Transfer using a Mass Transport Approach
Zhixin Shu, Sunil Hadap, Eli Shechtman, **Kalyan Sunkavalli**, Sylvain Paris, and Dimitris Samaras
ACM Transactions on Graphics, 2017
- [6] Consistent Video Filtering for Camera Arrays
Nicolas Bonneel, James Tompkin, Deqing Sun, Oliver Wang, **Kalyan Sunkavalli**, Sylvain Paris, and Hanspeter Pfister
Computer Graphics Forum (Proc. Eurographics), 2017
- [7] Appearance Harmonization for Single Image Shadow Removal
Li-Qian Ma, Jue Wang, Eli Shechtman, **Kalyan Sunkavalli**, and Shi-Min Hu
Computer Graphics Forum (Proc. Pacific Graphics), 2016
- [8] Sky is Not the Limit: Semantic-Aware Sky Replacement
Yi-Hsuan Tsai, Xiaohui Shen, Zhe Lin, **Kalyan Sunkavalli**, and Ming-Hsuan Yang
ACM Transactions on Graphics (Proc. SIGGRAPH), 2016
- [9] Blind Video Temporal Consistency
Nicolas Bonneel, James Tompkin, **Kalyan Sunkavalli**, Deqing Sun, Sylvain Paris, and Hanspeter Pfister
ACM Transactions on Graphics (Proc. SIGGRAPH Asia), 2015
- [10] High-Quality Hair Modeling from A Single Portrait Photo
Mengelei Chai, Linjie Luo, **Kalyan Sunkavalli**, Nathan Carr, Sunil Hadap, and Kun Zhou
ACM Transactions on Graphics (Proc. SIGGRAPH Asia), 2015
- [11] Smooth Loops for Unconstrained Video
Laura Sevilla-Lara, Jonas Wulff, **Kalyan Sunkavalli**, and Eli Shechtman
Computer Graphics Forum (Proc. EGSR), 2015
- [12] Interactive Intrinsic Video Editing
Nicolas Bonneel, **Kalyan Sunkavalli**, James Tompkin, Deqing Sun, Sylvain Paris, and Hanspeter Pfister
ACM Transactions on Graphics (Proc. SIGGRAPH Asia), 2014
- [13] Time-lapse Photometric Stereo and Applications
Fangyang Shen, **Kalyan Sunkavalli**, Nicolas Bonneel, Szymon Rusinkiewicz, Hanspeter Pfister, and Xin Tong
Computer Graphics Forum (Proc. Pacific Graphics), 2014
- [14] Automatic scene inference for 3D object compositing
Kevin Karsch, **Kalyan Sunkavalli**, Sunil Hadap, Nathan Carr, Hailin Jin, Rafael Fonte, Michael Sittig, and David Forsyth
ACM Transactions on Graphics, 2014
- [15] Example-based Video Color Grading
Nicolas Bonneel, **Kalyan Sunkavalli**, Sylvain Paris, and Hanspeter Pfister
ACM Transactions on Graphics (Proc. SIGGRAPH), 2013
- [16] Video Snapshots: Creating High-Quality Images from Video Clips
Kalyan Sunkavalli, Neel Joshi, Sing Bing Kang, Michael F. Cohen, and Hanspeter Pfister
IEEE Transactions on Visualization and Computer Graphics, 2012
- [17] Video Face Replacement
Kevin Dale, **Kalyan Sunkavalli**, Micah K. Johnson, Daniel Vlasic, Wojciech Matusik, and Hanspeter Pfister
ACM Transactions on Graphics (Proc. SIGGRAPH Asia), 2011
- [18] Multi-scale Image Harmonization
Kalyan Sunkavalli, Micah K. Johnson, Wojciech Matusik, and Hanspeter Pfister
ACM Transactions on Graphics (Proc. SIGGRAPH), 2010

- [19] Factored Time-Lapse Video
Kalyan Sunkavalli, Wojciech Matusik, Hanspeter Pfister, and Szymon Rusinkiewicz
ACM Transactions on Graphics (Proc. SIGGRAPH), 2007
- [20] Time-Varying BRDFs
 Bo Sun, **Kalyan Sunkavalli**, Ravi Ramamoorthi, Peter Belhumeur, and Shree Nayar
IEEE Transactions on Visualization and Computer Graphics, 2007
- [21] First steps toward an electronic field guide for plants
 Gaurav Agarwal, Peter Belhumeur, Steven Feiner, David Jacobs, W. John Kress, Ravi Ramamoorthi, Norman A. Bourg, Nandan Dixit, Haibin Ling, Dhruv Mahajan, Rusty Russell, Sameer Shirdhonkar, **Kalyan Sunkavalli**, and Sean White
Taxon, 2006

Refereed Conference Publications

- [22] Illuminant Spectra-based Source Separation Using Flash Photography
 Zhuo Hui, **Kalyan Sunkavalli**, Sunil Hadap, and Aswin C. Sankaranarayanan
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018 **(Oral)**
- [23] A Perceptual Measure for Deep Single Image Camera Calibration
 Yannick Hold-Geoffroy, **Kalyan Sunkavalli**, Matthew Fisher, Jonathan Eisenmann, Emiliano Gambaretto, Sunil Hadap, and Jean-François Lalonde
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018
- [24] Fast Video Object Segmentation by Reference-Guided Mask Propagation
 Seoung Wug Oh, Joon-Young Lee, **Kalyan Sunkavalli**, and Seon Joo Kim
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018 **(Spotlight)**
- [25] Reflectance Capture using Univariate Sampling of BRDFs
 Zhuo Hui, **Kalyan Sunkavalli**, Joon-Young Lee, Sunil Hadap, Jian Wang, and Aswin C. Sankaranarayanan
In Proc. International Conference on Computer Vision (ICCV), 2017
- [26] Scene Parsing with Global Context Embedding
 Wei-Chih Hung, Yi-Hsuan Tsai, Xiaohui Shen, Zhe Lin, **Kalyan Sunkavalli**, Xin Lu, and Ming-Hsuan Yang
In Proc. International Conference on Computer Vision (ICCV), 2017
- [27] Deep Outdoor Illumination Estimation
 Yannick Hold-Geoffroy, **Kalyan Sunkavalli**, Sunil Hadap, Emiliano Gambaretto, Jean-François Lalonde
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017 **(Oral)**
- [28] Neural Face Editing with Intrinsic Image Disentangling
 Zhixin Shu, Ersin Yumer, Sunil Hadap, **Kalyan Sunkavalli**, Eli Shechtman, and Dimitris Samaras
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017 **(Oral)**
- [29] Deep Image Harmonization
 Yi-Hsuan Tsai, Xiaohui Shen, Zhe Lin, **Kalyan Sunkavalli**, Xin Lu, and Ming-Hsuan Yang
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017
- [30] Single-image RGB Photometric Stereo With Spatially-varying Albedo
 Ayan Chakrabarti and **Kalyan Sunkavalli**
In Proc. International Conference on 3D Vision (3DV), 2016 **(Oral)**
- [31] Removing Shadows from Images of Documents
 Steve Bako, Soheil Darabi, Eli Shechtman, Jue Wang, **Kalyan Sunkavalli**, and Pradeep Sen
In Proc. Asian Conference on Computer Vision (ACCV), 2016
- [32] Shading-aware Multi-view Stereo
 Fabian Langguth, **Kalyan Sunkavalli**, Sunil Hadap, and Michael Goesele
In Proc. European Conference on Computer Vision (ECCV), 2016

- [33] White Balance under Mixed Illumination using Flash Photography
Zhuo Hui, Aswin Sankaranarayanan, **Kalyan Sunkavalli**, and Sunil Hadap
In Proc. IEEE International Conference on Computational Photography (ICCP), 2016
- [34] Automatic Content-Aware Color and Tone Stylization
Joon-Young Lee, **Kalyan Sunkavalli**, Zhe Lin, Xiaohui Shen, and In So Kweon
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016 (**Spotlight**)
- [35] PatchMatch-based Automatic Lattice Detection for Near-Regular Textures
Siyang Liu, Tian-Tsong Ng, **Kalyan Sunkavalli**, Minh Do, Eli Shechtman, and Nathan Carr
In Proc. International Conference on Computer Vision (ICCV), 2015
- [36] Visibility Subspaces: Uncalibrated Photometric Stereo with Shadows
Kalyan Sunkavalli, Todd Zickler, and Hanspeter Pfister
In Proc. European Conference on Computer Vision (ECCV), 2010
- [37] Image Restoration using Online Photo Collections
Kevin Dale, Micah K. Johnson, **Kalyan Sunkavalli**, Wojciech Matusik, and Hanspeter Pfister
In Proc. IEEE International Conference on Computer Vision (ICCV), 2009
- [38] What do color changes reveal about an outdoor scene?
Kalyan Sunkavalli, Fabiano Romeiro, Wojciech Matusik, Todd Zickler, and Hanspeter Pfister
In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2008 (**Oral**)
- [39] Time-Varying BRDFs
Bo Sun, **Kalyan Sunkavalli**, Ravi Ramamoorthi, Peter Belhumeur, and Shree Nayar
In Proc. Eurographics 2006 Workshop on Natural Phenomena, 2006
- [40] Parsing News Video Using Integrated Audio-Video Features
S. Kalyan Krishna, Raghav Subbarao, Santanu Chaudhury, and Arun Kumar
In Proc. International Conference on Pattern Recognition and Machine Intelligence, 2005

MENTORING

Interns

Zexiang Xu, University of California, San Diego, 2017
 Zhengqin Li, University of California, San Diego, 2017
 Marc-André Gardner, Laval University, 2016, 2017
 Yannick Hold-Geoffroy, Laval University, 2016, 2017
 Zhuo Hui, Carnegie Mellon University, 2015, 2016
 Michal Lukáč, Czech Technical University, 2015
 Joon-Young Lee, Korea Advanced Institute of Science and Technology, 2014
 Fabian Langguth, Technical University, Darmstadt, 2013, 2014
 Siyang Liu, University of Illinois, Urbana-Champaign, 2013
 Kevin Karsch, University of Illinois, Urbana-Champaign, 2012

AWARDS AND HONORS

Siebel Scholar, 2012
 John A. and Elizabeth S. Armstrong Fellowship, Harvard University, 2009
 Summer Research Fellowship, Jawaharlal Centre for Advanced Scientific Research, 2001
 National Talent Search Examination Scholarship, 1997 – 2003

PROFESSIONAL ACTIVITIES

Reviewer / Program Committee

IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Visualization and Computer Graphics, Journal of the Pattern Recognition Society, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, Journal of the Optical Society of America A, ACM SIGGRAPH, ACM SIGGRAPH Asia, IEEE Conference on Computer Vision and Pattern Recognition, IEEE International Conference on Computer Vision, European Conference on Computer Vision, Eurographics, Pacific Graphics, IEEE Visualization, Expressive