

Dilip Krishnan

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Education

Doctor of Philosophy, Computer Science Department, Courant Institute of Mathematical Sciences, New York University, New York. Advisor: Rob Fergus.

Master of Science (Mathematics) from National University of Singapore.

Graduate Diploma (Mathematics) from National University of Singapore.

Bachelor of Applied Science (Computer Engineering), Nanyang Technological University, Singapore (First Class Honors).

Publications

- K. Bousmalis, G. Trigeorgis, N. Silberman, D. Krishnan and D. Erhan. *Domain Separation Networks*, NIPS 2016 (To appear).
- P. Isola, D. Zoran, D. Krishnan and E. H. Adelson. *Learning Visual Groups from Co-occurrences in Space and Time*, ICLR (Workshop Paper) 2016.
- D. Zoran, P. Isola, D. Krishnan, W. T. Freeman, *Learning Ordinal Relationships for Mid-Level Vision*, ICCV 2015.
- Y. Shih, D. Krishnan, F. Durand, W. T. Freeman, *Reflection Removal using Ghosting Cues*, CVPR 2015.
- D. Krishnan, D. Zoran, J. Bento, W. T. Freeman, *Shape and Illumination from Shading using the Generic Viewpoint Assumption*, NIPS, 2014.
- P. Isola, D. Zoran, D. Krishnan, E. Adelson, *Crisp Boundary Detection using Pointwise Mutual Information*, ECCV 2014.
- Y. Shih, D. Krishnan, F. Durand, W. T. Freeman, *Reflection Removal using Ghosting Cues*, Under review, 2014.
- D. Krishnan, J. Bruna, R. Fergus, *Blind Deconvolution with Non-local Sparsity Weighting*, <http://arxiv.org/abs/1311.4029/>, 2014.
- D. Eigen, D. Krishnan and R. Fergus, *Restoring An Image Taken Through a Window Covered with Dirt or Rain*, ICCV 2013.
- D. Krishnan, R. Szeliski and R. Fattal, *Efficient Preconditioning of Laplacian Matrices for Computer Graphics*, Proceedings of SIGGRAPH, 2013.
- D. Krishnan, R. Szeliski, *Multigrid and Multilevel Preconditioners for Computational Photography*, SIGGRAPH Asia 2011.
- D. Krishnan, T. Tay, R. Fergus. *Blind Deconvolution using a Normalized Sparsity Measure*. Computer Vision and Pattern Recognition 2011.
- M. Zeiler, D. Krishnan, G. Taylor, R. Fergus. *Deconvolutional Networks*, Computer Vision and Pattern Recognition 2010.
- D. Krishnan, R. Fergus, *Analytic Hyper-Laplacian Priors for Fast Image Deconvolution*, Neural Information Processing Systems (NIPS), December 2009.
- D. Krishnan, R. Fergus, *Dark Flash Photography*. Proceedings of ACM SIGGRAPH August 2009.
- D. Krishnan, Q. V. Pham and A. M. Yip, *A Primal-dual Active-Set Algorithm for Bilaterally Constrained Total Variation Deblurring and Piecewise Constant Mumford-Shah Segmentation Problems*. Advances in Computational Mathematics, September 2008, doi 10.1007/s10444-008-9101-8.

- D. Krishnan, P. Lin and A. M. Yip, *A Primal-dual Active-set Method for Non-negativity Constrained Total Variation Deblurring Problems*, IEEE Trans. Image Processing, November 2007, pp. 2766-2777.
- D. Krishnan, P. Lin and X. C. Tai, *An Efficient Operator-Splitting Method for Noise Removal in Images*, Commun. Comput. Phys., 1 (2006), pp. 847-858.
- S. Kalra, D. Krishnan and M. N. Chong, *An MRF Model Based Scheme for Accurate Detection and Adaptive Interpolation of Missing Data in Image Sequences*, Proceedings of ICIP 1999.
- D. Krishnan, M. N. Chong and S. Kalra, *On the Computational Aspects of Gibbs-Markov Random Fields Modelling of Missing Data in Image Sequences*, IEEE Transactions on Image Processing, August 1999, pp 1139-1142.
- M. N. Chong, D. Krishnan, *An Edge-Preserving MRF Model for the Detection of Noise in Image Sequences*, IEEE Signal Processing Letters, April 1998, pp. 81-84.

Awards

- 2014: Janet Fabri Prize for Outstanding Dissertation in Computer Science at New York University.
- 2013: Outstanding reviewer citation, CVPR 2013.
- 2011: Dean's Dissertation Fellowship from Graduate School of Arts and Sciences, New York University (2012-2013).
- 2010: Microsoft Research PhD Fellowship (2010-2011, 2011-2012).
- 1998: Sony Prize for most creative final-year project.
- 1996: Part of 3-member Nanyang Technological University team which won the 1996 Texas Instruments Worldwide DSP Solutions Challenge. This was a university-level technical contest, and over 200 teams from universities worldwide took part. The challenge was to develop interesting applications for any of TI's family of DSP processors. Our team developed a set of motion picture restoration algorithms in a distributed multi-processor environment.
- 1994–1997: Undergraduate study at Nanyang Technological University sponsored by the SIA/NOL undergraduate scholarship scheme.
- 1994: Offered admission to the prestigious Indian Institutes of Technology (IIT).
- 1993: Awarded National Talent Search Examination (NTSE) Scholarship by the Government of India to support high school and university studies.

Areas of Expertise/Programming Languages/Environments

- C/C++, Python, Matlab, NVIDIA CUDA, Torch 7 (basic), Tensorflow.
- Familiarity with various Linux/Unix environments.

Work Experience

10 November 2014 - Present: Research Scientist, Google.

August 2013 – November 2014: Postdoctoral Associate, MIT (advisor: William Freeman).

April 2013 – December 2013: Consulting work for Madbits LLC (now acquired by Twitter), developing large-scale machine learning algorithms for image classification based on convolutional neural networks; replicated performance of the CNN of Krizhevsky et .al., NIPS 2012.

January 2007 – April 2008: Manager, Algorithms R&D, da Vinci Systems, Florida, USA (Now Black Magic Designs).

- Manager of the team that developed image processing algorithms on the NVIDIA G80 GPU (Graphics Processing Unit) platform. This was a critical project for our company's transition from custom hardware-based processing to GPU-based processing.
- Developed and optimized image and video processing algorithms for the G80 platform.

August 2005 – December 2006: Director and Consultant, da Vinci Technologies, Singapore.

- Project management and development, image processing algorithm research and development, software releases, code management (CVS), interaction with customers and product managers, and setting roadmaps for product lines.

April 2000 – August 2005: Engineering Manager and Director, da Vinci Technologies, Singapore.

- Manager of a team of software development engineers, working on da Vinci's Revival and Resolve line of products for the post-production and broadcast television industries.
- Research and development into video processing algorithms for digital restoration, digital color processing, image formatting and other types of image processing.
- Other responsibilities included leadership, software product development and management, personnel management, recruitment, annual reviews, product roadmap planning, interaction with customers, vendors, sales people, da Vinci management and annual budgeting. In short, all activities associated with running the Singapore office for the company were my responsibility.
- Execution of IDS development grant from the Economic Development Board of Singapore (2002-2004), worth S\$350,000.

September 1999 – April 2000: Co-Founder, Nirvana Digital, Singapore.

- Nirvana Digital was spun off from Singapore's Nanyang Technological University in June 1999, based on research performed by a team of 3 people including myself. Intellectual property was in the form of automated algorithms for digital film processing.
- In April 2000, Nirvana Digital was acquired by da Vinci Systems of Coral Springs, Florida, USA, and re-named da Vinci Technologies.
- Product still sold: <http://www.blackmagic-design.com/products/davincirevival/>

February 1998-September 1999: Research Engineer, Centre for Signal Processing, Nanyang Technological University, Singapore.

- Responsible for technology development leading to spin-off company, Nirvana Digital. This was an "incubation period" during which time we moved the product from a concept phase to an actual working prototype.

Professional Activities: Reviewer for the Following Conferences/Journals

- IEEE Transactions Pattern Analysis and Machine Intelligence.
- IEEE Transactions on Image Processing.
- IEEE Computer Vision and Pattern Recognition (CVPR).
- ACM Transactions on Graphics (SIGGRAPH) and SIGGRAPH Asia.
- Neural Information Processing Systems (NIPS).
- European Conference on Computer Vision (ECCV).
- Journal for Visual Comm. And Image Representation (JVCI).

Patents (2 issued, 3 under filing)

- Method, computer-accessible, medium and systems for facilitating dark flash photography : US Patent 9354490. Part of doctoral work done at NYU.
- System, method and computer-accessible medium for restoring an image taken through a window US Patent 9373160. Part of doctoral work done at NYU.
- 3 under filing (Google confidential).