

ANAT LEVIN

Department of Mathematics and Computer Science
The Weizmann Institute of Science
76100 Rehovot, Israel
Email: anat.levin@weizmann.ac.il
URL: <http://www.wisdom.weizmann.ac.il/~levina>

Education & Academic Appointments:

2009-Present: Senior Scientist (a.k.a. assistant professor), department of Mathematics and Computer Science, The Weizmann Institute of Science.

2007-2008: Postdoctoral Associate, MIT CSAIL.
Advisor: Prof William T. Freeman.

2002-2006: Ph.D.(*summa cum laude*), The Hebrew University of Jerusalem.
Thesis title: “Learning and inference in low level vision”.
Thesis Advisor: Prof. Yair Weiss.

2001: M.Sc.(*summa cum laude*), The Hebrew University of Jerusalem.
Field of study: Computer Science.
Thesis title: “On rigid and non-rigid shape invariants for image understanding purposes”.
Thesis Advisor: Prof. Amnon Shashua.

1998-2000: B.Sc.(*summa cum laude*), Hebrew University of Jerusalem.
Majors: Mathematics and Computer Science.
Dean’s List 1999.

Research Interests:

My research interests are in the areas of Computer Vision, Computer Graphics and Machine Learning. In particular I worked on computational photography, low and mid level vision.

Awards: Eurographics 2010 Young Researcher Award.

2009 Pazy Memorial Award. Most outstanding BSF supported project in mathematics and computer science for the year 2009.

TR35 2009 Young Innovator Award, MIT’s Technology Review. Recognizing exciting inventions and research by innovators under the age of 35.

IEEE Conf. on Computer Vision and Pattern Recognition (CVPR) 2009, best paper award runner up.

Alon Fellowship, Israel Council for Higher Education, 2009.

AI’s 10 to Watch, 2008 - 10 top young researchers selected by the IEEE Intelligent Systems magazine.

The Sara Lee Schupf Post-Doctoral award 2007, by the Weizmann Institute.

IEEE Conf. on Computer Vision and Pattern Recognition (CVPR) 2007, best paper award runner up.

Max Shlumiuk award for excellent Ph.D. dissertations at the Hebrew University.

Ph.D. *summa cum laude*.

European Conference on Computer Vision (ECCV) 2006, Longuet-Higgins best paper award.

The Kaye Innovation Award 2005, for innovations in the Hebrew University with high commercial potential.

Neural Information Processing Systems (NIPS) 2002 finalist for the Ben Wegbreit best student paper award.

Horowitz fellowship for Ph.D students.

M.Sc. *summa cum laude*.

B.Sc. *summa cum laude*.

Grants:

2009-2011 ISF (Israel Science Foundation), Legacy program, no. 1993/08
“Simplifying computer vision by novel camera and decoding algorithms”

2010-2013 BSF (USA-Israel Binational Science Foundation), no. 2008155
“Computational all focus imaging using light field analysis”
Joint with W. Freeman and F. Durand, MIT.
Awarded the Pazy memorial award.

2011-2015 ERC (European Research Council), no. 259091
“Understanding, Designing and Analyzing Computational Cameras”

Professional Activities:

Program committee, CVPR 2006-2011, ICCV 2007,2009, ECCV 2008,2010, ICCP 2009-2011.

Reviewed papers for SIGGRAPH annual conference 2005-2010, ACM Transaction on Graphics, IEEE Transactions on PAMI, IEEE Transactions on Image Processing.

Journal Publications:

A. Levin, Y. Weiss, F. Durand and W. T. Freeman. “Understanding and evaluating blind deconvolution algorithms”. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2011.

A. Levin, S. Hasinoff, P. Green, F. Durand, W. T. Freeman. “4D Frequency Analysis of Computational Cameras for Depth of Field Extension”. *SIGGRAPH, ACM Transactions on Graphics*, Aug 2009.

A. Levin and Y. Weiss. “Learning to Combine Bottom-Up and Top-Down Segmentation”. *International Journal of Computer Vision*, Accepted for publication.

A. Levin, A. Rav-Acha and D. Lischinski. “Spectral Matting”. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Oct 2008.

A. Levin, P. Sand, T. S. Cho, F. Durand, W. T. Freeman. “Motion-Invariant Photography”. *SIGGRAPH, ACM Transactions on Graphics*, Aug 2008.

A. Levin, R. Fergus, F. Durand and W. T. Freeman. “Image and Depth from a Conventional Camera with a Coded Aperture”. *SIGGRAPH, ACM Transactions on Graphics*, Aug 2007.

A. Levin, D. Lischinski and Y. Weiss. “A Closed Form Solution to Natural Image Matting”. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Feb 2008.

A. Levin and Y. Weiss. “User Assisted Separation of Reflections from a Single Image Using a Sparsity Prior”. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Sep 2007.

A. Zomet, A. Levin, S. Peleg and Y. Weiss “Seamless image stitching in the gradient domain”. *IEEE Transactions on Image Processing*, April 2006.

A. Levin, D. Lischinski and Y. Weiss. “Colorization using Optimization”. *SIGGRAPH, ACM Transactions on Graphics*, Aug 2004.

Refereed Conference Papers:

Note: Conferences are the major publication forum in the computer vision field. The top 3 computer vision conferences (ICCV, ECCV, CVPR) are highly competitive with low acceptance rates of less than 25%. ICCV and ECCV have CiteSeer impact factor rankings in the top 5% and 7%, respectively, of **all computer science** journals and conferences.

S. W. Hasinoff, A. Levin, P. R. Goode, and W. T. Freeman “Diffuse Reflectance Imaging with Astronomical Applications”. *IEEE International Conference on Computer Vision (ICCV)*, Nov 2011.

A. Levin and B. Nadler. “Natural Image Denoising: Optimality and Inherent Bounds”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2011.

A. Levin, Y. Weiss, F. Durand and W. T. Freeman. “Efficient Marginal Likelihood Optimization in Blind Deconvolution.”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2011.

A. Levin. “Analyzing Depth from Coded Aperture Sets”. *Proc. of the European Conference on Computer Vision (ECCV)*, Sep 2010.

A. Levin and F. Durand. “Linear View Synthesis Using a Dimensionality Gap Light Field Prior”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2010.

T. S. Cho, A. Levin, F. Durand, W. T. Freeman. “Motion blur removal with orthogonal parabolic exposures”. *IEEE International Conf. on Computational Photography (ICCP)*, April 2010.

A. Levin, Y. Weiss, F. Durand and W. T. Freeman. **Best paper award runner up.**

“Understanding and evaluating blind deconvolution algorithms”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2009.

A. Levin, W. T. Freeman and F. Durand. “Understanding camera trade-offs through a Bayesian analysis of light field projections”. *Proc. of the European Conference on Computer Vision (ECCV)*, Oct 2008.

A. Levin, A. Rav-Acha and D. Lischinski. **Best paper award runner up.**
“Spectral Matting”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2007.

A. Levin. “Blind Motion Deblurring Using Image Statistics”. *Advances in Neural Information Processing Systems (NIPS)* Dec 2006.

A. Levin, D. Lischinski and Y. Weiss. “A Closed Form Solution to Natural Image Matting”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2006.

A. Levin and Y. Weiss. “Learning to Combine Bottom-Up and Top-Down Segmentation”. **Longuet-Higgins best paper award.**
Proc. of the European Conference on Computer Vision (ECCV), LNCS 3954, p. 581-594, May 2006.

A. Levin and R. Szeliski “Visual Odometry and Map Correlation”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2004.

A. Levin, A. Zomet and Y. Weiss. “Separating Reflections from a Single Image Using Local Features”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2004.

A. Levin and Y. Weiss. “User Assisted Separation of Reflections from a Single Image Using a Sparsity Prior”. *Proc. of the European Conference on Computer Vision (ECCV)*, LNCS 3021, p. 602-613, May 2004.

A. Levin, A. Zomet, S. Peleg and Y. Weiss. “Seamless Image Stitching in the Gradient Domain”. *Proc. of the European Conference on Computer Vision (ECCV)*, LNCS 3024, p. 377-389, May 2004.

A. Levin, P. Viola and Y. Freund. “Unsupervised Improvement of Visual Detectors using Co-Training”. *International Conference on Computer Vision (ICCV)*, Oct 2003.

A. Levin, A. Zomet and Y. Weiss. “Learning How to Inpaint from Global Image Statistics”. *International Conference on Computer Vision (ICCV)*, Oct 2003.

A. Levin, A. Zomet and Y. Weiss. “Learning to Perceive Transparency from the Statistics of Natural Scenes”. **Finalist for the Ben-Wegbreit best student paper award.**

Advances in Neural Information Processing Systems (NIPS) Dec 2002.

A. Shashua and A. Levin. “Ranking with Large Margin Principle: Two Approaches”. *Advances in Neural Information Processing Systems (NIPS)* Dec 2002.

A. Levin and A. Shashua . “Principal Component Analysis Over Continuous Subspaces and Intersection of Half-spaces”. *Proc. of the European Conference on Computer Vision (ECCV)*, LNCS 2352, p.635-650, May 2002.

A. Levin and A. Shashua. “Revisiting Single-view Shape Tensors: Theory and Applications”. *Proc. of the European Conference on Computer Vision (ECCV)*, LNCS 2351, p.399-414, May 2002.

A. Shashua A. Levin and S. Avidan. “Manifold Pursuit: A New Approach to Appearance Based Recognition”. *Proc. of the Int. Conf. on Pattern Recog. (ICPR)*, Aug 2002.

A. Shashua and A. Levin. “Linear Image Coding for Regression and Classification using the Tensor-rank Principle”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, Dec 2001.

A. Levin L. Wolf and A. Shashua. “Time-varying Shape Tensors for Scenes with Multiply Moving Points”. *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, Dec 2001.

A. Shashua and A. Levin. “Multi-frame Infinitesimal Motion Model for the Reconstruction of (Dynamic) Scenes with Multiple Linearly Moving Objects”. *International Conference on Computer Vision (ICCV)*, July 2001.

Technical Reports:

A. Levin and R. Szeliski “Motion Uncertainty and Field of View” *Microsoft Research* MSR-TR-2006-37. May 2006.

A. Shashua, R. Meshulam, L. Wolf, A. Levin and G. Kalai. “Representation Theory in Computer Vision Problems”. Technical Report 2002-44, Leibniz Center for Research, School of Computer Science and Eng., The Hebrew University of Jerusalem, July, 2002