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Shmuel (Shai) Avidan

Education

1994 – 1999 The Hebrew University Jerusalem, Israel

Ph.D. in Computer Science, Summa cum Laude

- Thesis Advisor: Prof. Amnon Shashua
- Thesis Title: From Static to Dynamic Structure From Motion

1989 - 1993 Bar-Ilan University Ramat-Gan, Israel

B.Sc. in Computer Science and Mathematics, with honors

Professional experience

2009 - **Assistant Professor**
Faculty of Engineering,
Tel-Aviv University,
Tel-Aviv, Israel

2007 - 2010 **Senior Research Scientist**
Adobe Systems Inc.,
Newton, MA, USA

2004 - 2007 **Research Scientist**
Mitsubishi Electric Research Labs (MERL),
Cambridge, MA, USA

2001 - 2003 **Faculty Member**
Interdisciplinary Center (IDC),
Herzelya, Israel

2000 - 2003 **Algorithms Group Manager**
MobilEye Vision Technologies,
Jerusalem, Israel

1999 - 2000 **Post-doc Researcher**
Microsoft
Redmond, WA, USA
(Hosts: P. Anandan, Rick Szeliski)

Professional Activity

1. Associate Editor (2011 -)

   IEEE Transactions on Pattern Analysis and Machine Intelligence

2. Guest Editor - Special Issue of the Proceedings of the IEEE on Internet Vision - 2010

3. Area Chair: CVPR 2012, SIGGRAPH 2010, SIGGRAPH 2009, CVPR 2009, CVPR 2008, ICCV 2007

4. Workshops Chair - CVPR 2011

5. Program Chair – Internet Vision workshop, in conjunction with CVPR 2008.
6. Program Committee member - Workshop on Privacy Research in Vision, in conjunction with CVPR 2006.
7. Program Committee member - Workshop on Embedded Computer Vision, in conjunction with CVPR 2005.
8. NSF Panelist – Panel on Computer Vision, 2007
9. Regular reviewer for CVPR, ICCV, ECCV, TPAMI, SIGGRAPH

Ph.D. students supervised

1. Moshe Butman, Bar-Ilan University, Israel (co-supervised with Prof. Amihood Amir). Graduated 2008.
2. Tali Dekel (Basha), Tel-Aviv University, Israel (2009-Current).
3. Simon Korman, Tel-Aviv University, Israel (2010-Current).
4. Shaul Oron, Tel-Aviv University, Israel (2012-Current).
5. Dana Menaker, Tel-Aviv University, Israel (2013-Current).
6. Roy Jevnisek, Tel-Aviv University, Israel (2013-Current).

Ph.D. thesis-committee external member

1. Navneet Dalal, INRIA, France (Graduated 2006)
2. Qiang Zhu, UC Santa Barbara, CA, USA (Graduated 2007)
3. Severin Stalder, ETH Zurich, Switzerland (Graduated 2012)

Journal Publications

Student co-author denoted with $^{(s)}$

1. T. Basha$^{(s)}$, Y. Moses and S. Avidan. **Geometrically Consistent Stereo Seam Carving**. *IEEE Transactions on Patterns Analysis and Machine Intelligence (PAMI)*, Accepted (2013).

2. M. K. Johnson, K. Dale$^{(s)}$, S. Avidan, H. Pfister, W. T. Freeman and W. Matusik. **CG2Real**. *IEEE Transactions on Visualization and Computer Graphics (TVCG),* Vol. 17(9), pp 1273--1285, 2011.

3. B. Kaneva$^{(s)}$, J. Sivic, A. Torralba, S. Avidan and W.T. Freeman. Infinite Images: Creating and Exploring a Large Photorealistic Virtual Space. Proceedings of the IEEE, Vol. 98(8), pp 1391-1407, 2010.

4. T. S. Cho$^{(s)}$, S. Avidan and W. T. Freeman. **The patch transform**. *IEEE Transactions on Patterns Analysis and Machine Intelligence (PAMI)*, Vol. 32(8), pp. 1489--1501, 2010.

5. A. Shamir and S. Avidan. **Seam Carving for Media Retargeting.** Communication of the ACM (CACM), 2009

6. M. Rubinstein[(s)], A. Shamir and S. Avidan. **Multi-Operator Media Retargeting.** SIGGRAPH, Los Angeles, CA, 2008.

7. M. Rubinstein[(s)], A. Shamir and S. Avidan. **Improved Seam Carving for Video Retargeting**. SIGGRAPH, Los Angeles, CA, 2008.

8. E. Hsu[(s)], T. Mertens, S. Paris, S. Avidan and F. Durand. **Albedo Voting for White Balance under Mixed Lighting**. SIGGRAPH, Los Angeles, CA, 2008.

9. S. Avidan and A. Shamir. **Seam Carving for Content-Aware Image Resizing.** SIGGRAPH, San-Diego, CA, 2007.

10. N. Joshi[(s)], W. Matusik, S. Avidan, H. Pfister and W. T. Freeman. **Exploring Defocus Matting: Non-Parametric Acceleration, Super-Resolution, and Off-Center Matting.** Special Issue-Computational Photography of IEEE Journal on Computer Graphics and Applications, 2007.

11. S. Avidan. **Ensemble Tracking**. IEEE Transactions on Patterns Analysis and Machine Intelligence (PAMI), Vol. 29(2) pp. 261-271, 2007.

12. S. Avidan, Y. Moses and Y. Moses. **Centralized and Distributed Multi-view Correspondence.** *International Journal of Computer Vision (IJCV),* Vol. 71(1) pp 49-69, 2007.

13. N. Joshi[(s)], W. Matusik and S. Avidan. **Natural Video Matting using Camera Arrays.** SIGGRAPH, Boston, MA, 2006.

14. S. Avidan. **Support Vector Tracking.** *IEEE Transactions on Patterns Analysis and Machine Intelligence (PAMI),* Vol. 26(8) pp. 1064-1072, 2004.

15. S. Avidan and A. Shashua. **Threading Fundamental Matrices.** *IEEE Transactions on Pattern Analysis and Machine Intelligence* (PAMI), Vol. 23(1), pp. 73--77, 2001.

16. S. Avidan and A. Shashua. **Trajectory Triangulation: 3D Reconstruction of Moving Points from a Monocular Image Sequence.** *IEEE Transactions on Pattern Analysis and Machine Intelligence* (PAMI), Vol. 22(4), pp. 348--357, 2000**.**

17. S. Avidan and A. Shashua. **Novel View Synthesis by Cascading Trilinear Tensors***. IEEE Transactions on Visualization and Computer Graphics* (TVCG), 4(4), 1998.

Student co-author denoted with [(s)]

1. D. Shapira[(s)], S. Avidan and Y. Hel-Or. **Multiple Histogram Matching.** In International Conference on Image Processing (ICIP), 2013.

2. S. Korman[(s)], D. Reichman ,G. Tsur and S. Avidan. **FAsT-Match: Fast Affine Template Matching.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2013.

Major Conferences publications (refereed, acceptance rate usually bellow 25%)

3. T. Basha[(s)], Y. Moses and S. Avidan. **Photo Sequencing.** In European Conference on Computer Vision (ECCV), 2012.
4. I. Olonetsky[(s)] and S. Avidan. **TreeCANN - k-d tree Coherence Approximate Nearest Neighbor algorithm.** In European Conference on Computer Vision (ECCV), 2012.
5. I. Ben-Ami[(s)], T. Basha[(s)] and S. Avidan. **Racing Bib Number Recognition.** In British Machine Vision Conference (BMVC), 2012
6. S. Oron[(s)], A. Bar-Hillel, D. Levi and S. Avidan. **Locally Orderless Tracking.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2012.
7. T. Basha[(s)], S. Avidan, A. Hornung and W. Matusik. **Structure and Motion from Scene Registration.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2012.
8. X. Shen[(s)], Z. Lin, J. Brandt, S. Avidan, Y. Wu. **Object retrieval and localization with spatially-constrained similarity measure and k-NN re-ranking.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2012.
9. S. Pongnumkul[(s)], M. Dontcheva, W. Li, L. Bourdev, S. Avidan, J. Wang and M. Cohen. **Pause-and-play: Automatically Linking Screen cast Video Tutorials with Applications**. In ACM Symposium on User Interface Software and Technology (UIST), 2011.
10. S. Korman[(s)] and S. Avidan. **Coherency Sensitive Hashing.** In International Conference on Computer Vision (ICCV), 2011.
11. T. Basha[(s)], Y. Moses and S. Avidan. **Geometrically Consistent Stereo Seam Carving.** In International Conference on Computer Vision (ICCV), 2011.
12. A. Vazques-Reina[(s)], S. Avidan, H. Pfister and E. Miller. **Multiple Hypothesis Video Segmentation from Superpixel Flows.** In European Conference on Computer Vision (ECCV), 2010.
13. T. S. Cho[(s)], S. Avidan and W. T. Freeman. **A Probabilistic Jigsaw Puzzle Solver**. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2010.
14. L. Wolf, Z. Freund[(s)] and S. Avidan. **An Eye for an Eye: A Single Camera Gaze-Replacement Method.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2010.
15. L. Shapira[(s)], A. Shamir and S. Avidan. **Mode-Detection by Median-Shift**. In *International Conference on Computer Vision (ICCV),* Kyoto, Japan, 2009.
16. E. Zadicario[(s)], S. Avidan, A. Shmueli and D. Cohen-Or. **Boundary Snapping for Robust Image Cutouts**. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2008.

17. T. S. Cho[(s)], M. Butman[(s)], S. Avidan and W. T. Freeman. **A patch transform framework for image editing applications.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2008.

18. N. Joshi[(s)], S. Avidan, W. Matusik and D. Kriegman. **Synthetic Aperture Tracking: Tracking through Occlusions.** In *International Conference on Computer Vision (ICCV),* Rio de Janeiro, Brazil, 2007.

19. B. Moghaddam, Y. Weiss and S. Avidan. **Fast Pixel/Part Selection with Sparse Eigenvectors.** In *International Conference on Computer Vision (ICCV),* Rio de Janeiro, Brazil, 2007.

20. N. Morris[(s)], S. Avidan, W. Matusik and H. Pfister. Statistics of Infrared Images. To appear in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* Minneapolis, MN, 2007.

21. S. Avidan and M. Butman[(s)]. **Efficient Methods for Privacy Preserving Classification**. Advances in Neural Information Systems (*NIPS 18*), 2006.

22. B. Moghaddam, Y. Weiss and S. Avidan. **Generalized Spectral Bounds for Sparse LDA.** In *International Conference on Machine Learning (ICML),* Pittsburgh, PA, 2006.

23. Q. Zhu[(s)], S. Avidan, M. Ye and K-T Cheng. **Fast human detection using a cascade of Histograms of Oriented Gradients.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 1491-1498, NY, NY, 2006.

24. S. Avidan and M. Butman[(s)]. **Blind Vision.** In *European Conference on Computer Vision (ECCV),* pp 1-13, Graz, Austria, 2006.

25. S. Avidan. **SpatialBoost: Adding Spatial Reasoning to AdaBoost.** In *European Conference on Computer Vision (ECCV),* pp 386-396, Graz, Austria, 2006.

26. B. Moghaddam, Y. Weiss and S. Avidan. **Spectral Bounds for Sparse PCA: Exact and Greedy Algorithm.** In *Advances in Neural Information Systems (NIPS 17), 2005.*

27. Q. Zhu[(s)], S. Avidan and K-T Cheng. **Learning a Sparse, Corner-based Representation for Time-varying Background Modeling.** In *International Conference on Computer Vision (ICCV),* pp 678-685, Beijing, China, 2005.

28. S. Avidan. **Ensemble Tracking.** In IEEE Conference on Computer Vision and Pattern Recognition (CVPR), pp 494-501, San Diego, CA, 2005.

29. S. Avidan and M. Butman[(s)]. **The power of feature clustering: An application to object detection.** In *Advances in Neural Information Systems (NIPS 16), 2004.*

30. S. Avidan. **Joint Feature-Basis Subset Selection.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 283-290, Washington D.C. 2004.

31. P. Reisman, O. Mano, S. Avidan and A. Shashua. **Crowd Detection in video sequences.** *In IEEE Inteliggent Vehicles Symposium (*IV*),* Parma, Italy, 2004.

32. S. Avidan, Y. Moses and Y. Moses. **Probabilistic Multi-view Correspondence in a Distributed Setting.** *In European Conference on Computer Vision (ECCV),* pp 428-441, Prague, Czech Republic, 2004.

33. S. Avidan. **Subset Selection for Efficient SVM Tracking.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 85-94*,* Madison, WI, 2003.

34. *S. Avidan.* **EigenSegments: A Spatio-Temporal Decomposition of an Ensemble of Images.** *In European Conference on Computer Vision (ECCV),* pp 747-758*,* Copenhagen, Denmark, 2002.

35. A. Shashua, A. Levin and S. Avidan. **Manifold Pursuit: A New Approach to Appearance Based Recognition.** In *Proceedings of the International Conference on Pattern Recognition* (*ICPR*), pp 590-594, Quebec City, Canada, 2002.

36. S. Avidan. **Support Vector Tracking.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 184-191 Hawaii, USA, 2001.

37. R. Szeliski, S. Avidan and P. Anandan. **Layer Extraction from multiple images containing reflections and transparency.** In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 1246-1253, Hilton Head Island, 2000.

38. P. Anandan and S. Avidan. **Integrating local affine into global projective images in the joint image space.** *In European Conference on Computer Vision (ECCV),* pp 907-921, Dublin, Ireland, 2000.

39. A. Shashua and S. Avidan. **On the Reprojection of 3D and 2D Scenes without explicit model selection.** *In European Conference on Computer Vision (ECCV),* pp 936-949*,* Dublin, Ireland, 2000.

40. A. Shashua, S. Avidan and M. Werman. **Trajectory Triangulation over Conic Sections.** *International Conference on Computer Vision (ICCV),* pp 330-336*,* Kerkyra, Corfu, Greece*, 1999.*

41. S. Avidan and A. Shashua. **Trajectory Triangulation of Lines: Reconstruction of a 3D point Moving along a Line from a Monocular Image Sequence.** *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR),* pp 2062-2066, Ft. Collins, CO, 1999**.**

42. S. Avidan and A. Shashua. **Threading Fundamental Matrices***. In European Conference on Computer Vision (ECCV),* pp 124-140*,* Frieburg, Germany, 1998.

43. S. Avidan, T. Evgeniou, A. Shashua and T. Poggio. **Image-Based View Synthesis by Combining Trilinear Tensors and Learning Techniques.** *In* ACM Symposium on Virtual Reality Software and Technology*,* pp 103-110, Lausanne, Switzerland, 1997.

44. S. Avidan and A. Shashua. **Novel View Synthesis in Tensor Space**. *In IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 1034-1040*,* San Juan, Puerto Rico,1997.

45. *B. Rousso, S. Avidan, A. Shashua and S. Peleg.* **Robust Recovery of Camera Rotation from Three Frames**. *In IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* pp 796-802*,* San-Francisco, CA, 1996.

46. *A. Shashua and S. Avidan.* **The Rank4 Constraint In Multiple View Geometry.** *In European Conference on Computer Vision (ECCV),* pp 196-206, Cambridge, UK, 1996.

Book Chapters

1. S. Avidan and A. Shashua. **Tensor Embedding of the Fundamental Matrix**. In Post-ECCV SMILE Workshop, June 1998, Frieburg, Germany. Springer LNCS series, Vol. 1506

Other Publications

1. S. Avidan and A. Shashua. **Tensorial Transfer: On the Representation of $N>3$ Views of a 3D Scene**. In Proc. of the ARPA Image Understanding Workshop, Palm Springs, Feb. 1996.

Personal Information:

Date of Birth	July 8, 1968.
Marital Status	Married with three children.
Citizenship	Israeli