

Curriculum Vitae

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Ohad Ben-Shahar, Professor

Personal Details and Contact Information

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Education

12/2003 **Ph.D.** **Yale university**, New Haven, CT.
Department: Computer science
Thesis: *The perceptual organization of visual flows*
Advisor: Steven W. Zucker

01/1999 **M.Phil.** **Yale university**, New Haven, CT.
Department: Computer science

03/1996 **M.Sc.** **Technion, Israel Institute of Technology**, Haifa, Israel.
Department: Computer science
Thesis: *On the rearrangement of movable objects by a mobile robot*
Advisor: Ehud Rivlin

03/1989 **B.Sc.** (*summa cum laude*) **Technion, Israel Institute of Technology**, Haifa, Israel.
Department: Computer science

Employment History

Jun 2015 - Present **Professor**, Dep. of Computer Science, Ben Gurion University, Israel.
Oct 2011 - June 2015 **Associate Professor**, Dep. of Computer Science, Ben Gurion University, Israel.
Sep 2004 - Sep 2011 **Senior Lecturer**, Dep. of Computer Science, Ben Gurion University, Israel.
Dec 2003 - Aug 2004 **Postdoctoral Associate**, Dep. of Computer Science, Yale university, CT.
Jan 1997 - Dec 2003 **Research Assistant**, Dep. of Computer Science, Yale university, CT.
Mar 1996 - Jan 1997 **R&D Engineer**, Elscint Corp., Haifa, Israel.
Mar 1994 - Mar 1996 **Research Assistant**, Dep. of Computer Science, Technion, Israel.
Mar 1989 - Mar 1994 **R&D Engineer**, IDF (Israel Defense Force), Israel.

Professional Activities and Service

• Position in university and academic administration

- 2018-present : Steering committee, Center for Data Science Research, BGU..
- 2017-present : Chair, Computer Science Department, BGU.
- 2015-present : Steering committee, School of Brain and Cognitive Sciences, BGU.
- 2015-2017 : Steering committee, Computer Science department, BGU.
- 2013-2017 : Steering committee, ABC Robotics center, BGU.
- 2013-2017 : Director, Computer Science program, Achva College.
- 2012-present : Promotions and hiring committee, Computer Science Dept., BGU.
- 2010-2012 : Senate member, BGU.
- 2007-Present : Steering committee, Brain and Cognitive Sciences Department, BGU.
- 2008-2010 : Steering committee, Zlotowski Center for Neuroscience Research, BGU.
- 2006-2009 : Director of undergraduate studies (junior students), Computer Science Dept., BGU.
- 2000-2003 : Founding organizer, CVC Round Table, Yale university.

• Editorial boards

- 2010-2015 Associate Editor - Journal of Visual Communication and Image Representation.

• National Grant committees

- Israel Science Foundation (ISF)

• Conference organization and program committees

- 2018 Program committee - European Conference on Computer Vision (ECCV).
- 2018 Co-Organizer - New Trends in Image Restoration and Enhancement (CVPR workshop), USA.
- 2017 Co-Chair - Image Dynamics in Material and Shape Perception Symposium, Germany.
- 2016 General chair - Sensing: from Minds to Machines Conference, Israel.
- 2016 Program committee - European Conference on Computer Vision (ECCV).
- 2015 Program committee - IEEE International Conference on Computer Vision (ICCV).
- 2015 Program committee - IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- 2014 Program committee - European Conference on Computer Vision (ECCV).
- 2014 Program committee - Minerva school on Cognitive Robotics, Berlin, Germany.
- 2014 Program committee - Israel Machine Vision Conference (IMVC).
- 2014 Program committee - IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- 2013 Steering Committee - Israel Machine Vision Conference (IMVC).
- 2012 Steering Committee - Israel Machine Vision Conference (IMVC).
- 2012 Co-Chair - Animal Visual Search Symposium (part of ICN).
- 2012 Program committee - European Conference on Computer Vision (ECCV).
- 2012 Program committee - IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- 2011 Program committee - IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- 2011 Steering Committee - Israel Machine Vision Conference (IMVC).
- 2010 Program Committee - Perceptual Organization in Visual Computing (part of ISVC).
- 2009 Organizer and Chair - BGU Interdisciplinary Vision Day (BGUVD09).
- 2009 Program committee - IEEE International Conference on Computer Vision (ICCV).
- 2009 Program committee - IEEE Conference on Computer Vision and Pattern Recognition (CVPR).
- 2007 Program committee - IEEE International Conference on Computer Vision (ICCV).
- 2007 Organizer and Chair - BGU Interdisciplinary Vision Day (BGUVD07).
- 2006 Program committee - IEEE Workshop on Perceptual Organization in Computer Vision (POCV).
- 2006 Organizer and Chair - BGU Interdisciplinary Vision Day. (BGUVD06)

- **Manuscript reviewing - Journal papers**

IEEE transactions on Pattern Analysis and Machine Intelligence
IEEE transactions on Robotics and Automation
Journal of Intelligent & Robotic Systems
Medical Image Analysis
IEEE transactions on System, Man, and Cybernetics
Pattern Recognition
Pattern Recognition Letters
Journal of Mathematical Imaging and Vision
Soft Computing
International Journal of Pattern Recognition and Artificial Intelligence.
British Journal of Psychology
Spatial Vision
Journal of Vision
Journal of Physiology-Paris
Vision Research

- **Manuscript reviewing - Conference papers**

IEEE International Conference on Computer Vision (ICCV)
IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
European Conference on Computer Vision (ECCV)
International Conference on Computer Analysis of Images and Patterns (CAIP)
International Workshop on Biologically Motivated Computer Vision (BMCV)
Asian Conference on Computer Vision (ACCV),
International Conference on Computer Graphics and Interactive Techniques (SIGGRAPH)

- **Funding agencies reviewing**

Israel Science Foundation (ISF)
United States-Israel Binational Science Foundation (BSF)
The German Israeli Foundation (GIF)
India-Israel Binational Program
Israel Ministry of Health

- **Membership in professional societies**

2017-Present ACM SIGGRAPH
2012-Present International Society for Neuroethology (ISN)
2002-Present Vision Sciences Society (VSS)
1996-Present Institute of Electrical and Electronics Engineers (IEEE)
2012-2014 International Association of Pattern Recognition (IAPR)
2008-2010 Society for Neuroscience (SfN)

Teaching Activities

- **Courses taught** (U-Undergraduate, G-Graduate)

Computational and Biological Vision	G+U	Ben-Gurion University, Israel.
Introduction to Numerical Analysis	U	Ben-Gurion University, Israel.
Selected Topics in Computational Vision	G	Ben-Gurion University, Israel.
Cognition and Computation	G	Ben-Gurion University, Israel.
Research seminar	G	Ben-Gurion University, Israel.
Advanced Topics in Computational Vision	U	Ben-Gurion University, Israel.
Software Engineering Project	U	Ben-Gurion University, Israel.
Computer Science Project	U	Ben-Gurion University, Israel.
Programming languages	U	Technion, Israel.

Research Students and Theses Advised

- **In progress**

<i>Efrat Taig</i>	Postdoctoral researcher, 2018
<i>Boaz Arad</i>	toward Ph.D., expected in 2018.
<i>Rotem Mairon</i>	toward Ph.D., expected in 2019.
<i>Moshe Elisof</i>	toward M.Sc., expected in 2020.

- **Postdoctoral Alumni**

2013	<i>Alik Mokeichev</i>	Natural image statistics in early image representations
2010	<i>Rami Ben-Ari</i>	Fast and robust visual tracking

- **Ph.D Alumni**

2018	<i>Efrat Taig</i>	Global optimization with gradient heuristics
2017	<i>Ehud Barnea</i>	On employing spatial statistics for the prediction of object and visual element locations
2013	<i>Ilan Kadar</i>	From perceptual relations to scene gist recognition
2013	<i>Yair Adato</i>	From specular shape reconstruction to complex motion estimation
2012	<i>Alik Mokeichev</i>	The geometry of color and its interactions in early and mid-level vision
2012	<i>Guy Ben-Yosef</i>	Visual curve completion in the tangent bundle

- **M.Sc. Alumni**

- 2017 *Shir Gur*
From square pieces to brick walls: The next challenge in solving jigsaw puzzles
- 2017 *Gal Nir*
Multi inducer grouping for curve completion: Perceptual and computational exploration
- 2014 *Rotem Mairon*
The contextual emergence of visual saliency
- 2013 *Ehud Barnea*
RGB-D object detection from partial pose estimation of symmetric objects
- 2013 *Or Piamante* (co-advised with Maoz Shamir, BGU)
Neuronal coding of orientation in the primary visual cortex of the macaque monkey
- 2012 *Dolev Pomeranz*
A fully automated greedy square jigsaw puzzle solver
- 2011 *Michal Shemesh*
Free boundary active contours with applications to computer vision.
- 2010 *Liana Diesendruck*
Overt and covert attention interact with curvature-based perceptual singularities.
- 2009 *Hadassa Dalrophe*
Curvature-based statistics of edge co-occurrence.
- 2009 *Eran Korkidi* (co-advised with Amir Shapiro, BGU)
Design and control of an autonomous apparatus for spraying date palm trees
- 2008 *Ilan Kadar*
Evolving boundary detectors for natural images via genetic programming
- 2008 *Maor Mishkin*
Hierarchical tracking - A novel framework for robust multi-target tracking
- 2008 *Yair Adato*
On the reconstruction of specular shape from images
- 2007 *Moran Hirsh*
Compact texture representation via scale-space dynamics.
- 2007 *Guy Ben-Yosef*
Computational and biologically plausible models for curvature-based pre-attentive texture segregation
- 2007 *Alik Mokeichev*
Stochastic emergence of repeating cortical motifs in spontaneous membrane potential fluctuations

Research Grants

[G24] **Sensing: From minds to machines**

Ministry of Science, Technology and Space, Israel.

Principle Investigators: Ohad Ben-Shahar

Period: 2016. Amount: \$11,000.

[G23] **Sensing: From minds to machines**

Israel Science Foundation - (Workshop grant 2142/16), Israel.

Principle Investigators: Ohad Ben-Shahar and Boaz Rafaeli

Period: 2016. Amount: \$31,000.

[G22] **An Autonomous service robot for elderly users with limited mobility and vision**

Ministry of Science, Technology, and Space, Israel.

Principle Investigators: Ronen Brafman, Gay Shani, Michael Elhada, and Ohad Ben-Shahar.

Period: 05/2016-04/2019. Amount: \$300,000.

[G21] **Visuo-motor adaptation without a cortex: how does the archer fish solve the refraction problem?**

Israel Science Foundation - (FIRST/Bikura 0281/15), Israel.

Principle Investigators: Ronen Segev, Ofer Donchin, and Ohad Ben-Shahar.

Period: 10/2015-09/2018. Amount: \$300,000.

[G20] **OMEK (Depth) - Technologies for acquisition and processing of 3D information**

Magnet Program, Chief Scientist, Ministry of Industry and Trade, Israel

Principle Investigator: Ohad Ben-Shahar

Period: 06/2015-05/2019. Amount: approx \$300,000.

[G19] **Sweet pepper harvesting robot (SWEEPER)**

Horizon 2020 project under the ICT Program (involving 6 European groups).

Israeli Principle Investigators: Ohad Ben-Shahar, Yael Edan, and Israel Parmet.

Period: 02/2015-1/2018. Total project budget: approx. €4,000,000. Israeli budget: approx €550,000.

[G18] **Automated identification of potato diseases using digital images**

Chief scientist - Ministry of Agriculture (Grant 857-0710-14), Israel.

Principle Investigators: Guy Shani, Victor Elchanati, Lea Tsrer, Ohad Ben-Shahar.

Period: 10/2013-09/2019. Amount: \$150,000. Withdrawn by PI request.

[G17] **Lazy neurons for good shape**

The National Institute for Psychobiology (101-12-13), Israel.

Principle Investigator: Ohad Ben-Shahar.

Period: 10/2012-09/2015. Amount: \$150,000.

[G16] **Visual curve completion in the tangent bundle - Theory and applications**

Israel Science Foundation - (ISF 0259/12), Israel.

Principle Investigator: Ohad Ben-Shahar.

Period: 10/2012-09/2016. Amount: \$185,000.

[G15] **Active vision: from animal behavior to robotics**

Israel Science Foundation - (FIRST/Bikura 1274/11), Israel.

Principle Investigators: Yoram Gutfreund, Alon Wolf, and Ohad Ben-Shahar.

Period: 10/2011-09/2014. Amount: \$190,000.

- [G14] **Clever Robotics for Crops (cRops)**
FP7 Large-scale Integrating Project under the NMP Program (involving 15 European groups).
Israeli Principle Investigators: Yael Edan, Ohad Ben-Shahar, and Amir Shapiro.
Period: 10/2010-09/2014. Total project budget: €7,640,000. Israeli budget: €973,000.
- [G13] **Autonomous system for spraying in vineyards**
Chief scientist - Ministry of Agriculture, Israel.
Principle Investigators: Amir Shapiro, Yael Edan, and Ohad Ben-Shahar.
Period: 10/2009-09/2012. Amount: \$130,000.
- [G12] **Autonomous spraying robot for pepper greenhouses**
Chief scientist - Ministry of Agriculture, Israel.
Principle Investigators: Avital Bachar, Yael Edan, Amir Shapiro, and Ohad Ben-Shahar.
Period: 10/2009-09/2012. Amount: \$200,000.
- [G11] **Shape from specular flows – Theory, practice, and applications**
Israel Science Foundation (ISF 1245/08), Israel.
Principle Investigator: Ohad Ben-Shahar.
Period: 10/2008-09/2013. Amount: \$180,000.
- [G10] **Self-stabilizing and efficient robust uncertainty management in swarms of UAV**
Air Force Office of Scientific Research (AFOSR), USA.
Principle Investigators: Michael Segal, Shlomi Dolev, and Ohad Ben-Shahar.
Period: 10/2008-09/2011. Amount: \$145,000.
- [G9] **Mechanisms of active vision in barn owls**
DFG - Deutsche Forschungsgemeinschaft, Germany.
Principle Investigators: Hermann Wagner, Ohad Ben-Shahar, and Ehud Rivlin.
Period: 02/2008-08/2010. Amount: \$150,000.
- [G8] **A autonomous robotic system for targeted sparying of date palm trees**
Chief scientist - Ministry of Agriculture, Israel.
Principle Investigators: Amir Shapiro, Ohad Ben-Shahar, and Yael Edan.
Period: 04/2008-03/2011. Amount: \$100,000.
- [G7] **Toward shape from specular reflections under real-world illumination**
National Science Foundation (NSF IIS-0712956), USA.
Principle Investigators: Todd Zickler and Ohad Ben-Shahar.
Period: 09/2007-08/2010. Amount: \$380,000.
- [G6] **Visual saliency without feature gradient - Implications to computer vision and graphics**
The BGU foundation for the promotion of research, Israel.
Principle Investigator: Ohad Ben-Shahar.
Period: 10/2007-09/2008. Amount: \$10,000.
- [G5] **Perceptual singularities without feature gradient - Implications to attentional selection**
The National Institute for Psychobiology (207-07-08), Israel.
Principle Investigator: Ohad Ben-Shahar.
Period: 10/2007-09/2009. Amount: \$50,000.
- [G4] **A robotic system for targeted spraying in orchards and vineyards**
Ministry of Science, Israel.
Principle Investigators: Amir Shapiro, Ohad Ben-Shahar, and Yael Edan.
Period: 04/2007-03/2009. Amount: \$40,600.

- [G3] **Texture segmentation and description for 4th generation visual inspection machines**
IMG4 (Magnet Program) - Ministry of Industry and Trade, Israel
Principle Investigators: Itshak Dinshtein, Ohad Ben-Shahar, and Klara Kedem.
Period: 08/2005-07/2010. Amount: approx \$950,000.
- [G2] **A robotic apparatus for pollinating date palm trees**
ICA, Israel.
Principle Investigators: Amir Shapiro, Ohad Ben-Shahar, and Yael Edan.
Period: 07/2006-12/2007. Amount: \$18,000.
- [G1] **A new approach to future farming**
The Dutch-Israel Agricultural Science and Technology Program
Principle Investigators: Amir Shapiro, Ohad Ben-Shahar, and Yael Edan.
Period: 01/2007 (workshop grant). Amount: \$16,000.
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Patents

- [P2] O. Ben-Shahar and B. Arad, **Enhanced capacity consumer camera with hyperspectral compressed sensing central processing**, US provisional application 62/518038, 2017.
- [P1] O. Ben-Shahar and B. Arad, **Spectral data approximation**, US provisional application 61/862560, 2016.
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Scientific Publications

• Chapters in collective volumes and books

- [BC9] I. Kadar and O. Ben-Shahar, **SceneNet: A Perceptual Ontology for Scene Understanding**, In the *Proceedings of the International Workshop on Computer vision + ONTology Applied Cross-disciplinary Technologies (CONTACT)*, Springer's Lecture Notes in Computer Science (LNCS), Vol. 8926, 2015.
- [BC8] R. Mairon and O. Ben-Shahar, **A closer look at context: From coxels to the contextual emergence of object saliency**, In *European Conference on Computer Vision*, Springer's Lecture Notes in Computer Science (LNCS), Vol. 8692, pp. 708-724, 2014.
- [BC7] E. Barnea and O. Ben-Shahar, **Depth Based Object Detection from Partial Pose Estimation of Symmetric Objects**, In *European Conference on Computer Vision*, Springer's Lecture Notes in Computer Science (LNCS), Vol. 8693, pp. 377-390, 2014.
- [BC6] G. Ben-Yosef and O. Ben-Shahar, **A biologically-inspired theory for non-axiomatic parametric curve completion**, In *Asian Conference on Computer Vision*, Springer's Lecture Notes in Computer Science (LNCS), Vol. 6493, pp. 346-359, 2011.
- [BC5] O. Ben-Shahar and S.W. Zucker, **Good continuation in layers: Shading flows, color flows, surfaces, and shadows**, in *Information Beyond Inference*, L. Albertazzi, G.J. van Tonder, and D.Vishwanath (Ed.), MIT Press, 2010.

- [BC4] O. Ben-Shahar, G. Li, and S.W. Zucker, **Connection Geometry, Color, and Stereo**, In *Computer Analysis of Images and Patterns*, Springer's Lecture Notes in Computer Science (LNCS), Vol. 4673, pp. 13-198, 2007.
- [BC3] O. Ben-Shahar and S.W. Zucker, **Boundary gestalt limits flow gestalt: The geometry of good continuation**, in *Visual thought: The depictive space of the mind*, L. Albertazzi (Ed.), John Benjamin Publishing Company, pp. 115-131, 2006.
- [BC2] O. Ben-Shahar and S.W. Zucker, **Hue geometry and horizontal connections**, in *Vision and Brain*, S. Grossberg, L. Finkel, and D. Field (Eds.), Elsevier, pp. 753-772, 2004
- [BC1] O. Ben-Shahar, P. Huggins, and S.W. Zucker, **On computing visual flows with boundaries: The case of shading and edges**, In *Biologically Motivated Computer Vision*, Springer's Lecture Notes in Computer Science (LNCS), Vol. 2525, pp. 189-198, 2002.

- **Journal articles (published or in press)**

- [J38] M. Ben-Tov, O. Ben-Shahar, R. Segev, **What a predator can teach us about visual processing: a lesson from the archerfish**, *Current Opinion in Neurobiology* (CONEUR), (in press).
- [J37] J. Orłowski, O. Ben-Shahar, H. Wagner, **Visual search in barn owls: Task difficulty and saccadic behavior**, *Journal of Vision* (JOV), 18(1):4, pp. 1-13, 2018.
- [J36] G. Nir, B. Arad, O. Ben-Shahar, **Multi inducer grouping for curve completion: Perceptual and computational exploration**, *Journal of Vision* (JOV), 17(9):8, pp. 1-15, 2017.
- [J35] D.N. Dovencioğlu, O. Ben-Shahar, P. Barla, and K. Doerschner, **Specular motion and 3D shape estimation**, *Journal of Vision* (JOV), 17(6):3, pp. 1-15, 2017.
- [J34] E. Barnea, R. Mairon, and O. Ben-Shahar, **Colour-agnostic shape-based 3D fruit detection for crop harvesting robots**, *Biosystems Engineering*, 146, pp. 57-70, 2016.
- [J33] R. Ben-Ari and O. Ben-Shahar, **A computationally efficient tracker with direct appearance-kinematic measure and adaptive Kalman filter**, *Journal of Real-Time Image Processing*, 11, 271-285, 2016.
- [J32] J. Orłowski, C. Beissel, F. Rohn, Y. Adato, H. Wagner, O. Ben-Shahar, **Visual pop-out in barn owls: Human-like behavior in the avian brain**, *Journal of Vision*, 15(14):4, 1-13, 2015.
- [J31] R. Berenstein, M. Hocevar, T. Godesa, Y. Edan, O. Ben-Shahar, **Distance dependent multimodal image registration for agriculture tasks**, *Sensors*, 15(8), 20845-20862, 2015.
- [J30] M. Ben-Tov, O. Donchin, O. Ben-Shahar*, and R. Segev*. **Pop-out in visual search of moving targets in the archer fish**, *Nature Communications*, 6:6476, pp. 1-11, 2015
 (* = Equal contribution)

- [J29] D.N. Dovencioğlu, M.W. Wijntjes, O. Ben-Shahar, and K. Doerschner. **Effects of surface reflectance on local second order shape estimation in dynamic scenes**, *Vision Research*, 115, 218-230, 2015.
- [J28] O. Ben-Shahar and G. Ben-Yosef, **Tangent bundle elastica and computer vision**, *IEEE Transaction on Pattern Analysis and Machine Intelligence (PAMI)*, 37(1), 161-174, 2015
- [J27] M. Ben-Tov, I. Kopilevich, O. Donchin, O. Ben Shahar, C. Giladi, and R. Segev, **Visual Receptive Field Properties of Cells in the Optic Tectum of the Archer Fish**, *Journal of Neurophysiology (JNP)*, 100(3), 748-759, 2013.
- [J26] O. Ben-Shahar, S. Dolev, A. Dolgin, and M. Segal, **Direction election in flocking swarms**, *Ad Hoc Networks*, 12, 250-258, 2014.
- [J25] I. Kadar and O. Ben-Shahar, **A perceptual paradigm and psychophysical evidence for hierarchy in scene gist processing**, *Journal of Vision*, 12(13), 117, 2012.
- [J24] A. Ben-Simon, O. Ben-Shahar, G. Vasserman, M. Ben-Tov, and R. Segev, **Visual Acuity in the Archer Fish: Behavior, Anatomy, and Neurophysiology**, *Journal of Vision*, 12(12), 1-19, 2012.
- [J23] A. Ben-Simon, O. Ben-Shahar, G. Vasserman, and R. Segev, **Predictive Saccade in the Absence of Smooth Pursuit: Interception of Moving Targets in the Archer Fish**, *Journal of Experimental Biology*, 215, 4248-4254, 2012
- [J22] G. Ben-Yosef and O. Ben-Shahar, **Tangent bundle curve completion with locally connected parallel networks**, *Neural Computation*, 24(12), 3277-3316, 2012.
- [J21] G. Ben-Yosef and O. Ben-Shahar, **A tangent bundle theory for visual curve completion**, *IEEE Transaction on Pattern Analysis and Machine Intelligence*, 34(7), 1263-1280, 2012.
- [J20] K. Kapach, E. Barnea, R. Mairon, Y. Edan, and O. Ben-Shahar, **Computer Vision for Fruit Harvesting Robots - State of the Art and Challenges Ahead**, *International Journal of Computational Vision and Robotics*, 3(1/2), 4-34, 2012.
- [J19] W. Harmening, J. Orłowski, O. Ben-Shahar, and H. Wagner, **Overt attention towards oriented objects in free viewing barn owls**, *Proceedings of the National Academy of Sciences of the USA (PNAS)*, 108(20), 8461-8466, 2011.
- [J18] A. Mokeichev, R. Segev, and O. Ben-Shahar, **Orientation saliency without visual cortex and target selection in archer fish**, *Proceedings of the National Academy of Sciences of the USA (PNAS)*, 107(38), 16726-16731, 2010. Research featured in *Science's* headline news (*Science Now*), *The Scientist*, *Discover* magazine, the *Digital Journal* and other science news outlets.
- [J17] Y. Adato, Y. Vasilyev, T. Zickler, and O. Ben-Shahar, **Shape from specular flow**, *IEEE Transaction on Pattern Analysis and Machine Intelligence (PAMI)*, 32(11), 2054-2070, 2010.
- [J16] R. Berenstrin, O. Ben-Shahar, A. Shapiro, and Y. Edan, **Grape clusters and foliage detection algorithms for autonomous selective vineyard sprayer**, *Intelligent Service Robotics (ISR)*, 3(4), 233-243, 2010.

- [J15] O. Ben-Shahar and S.W. Zucker, **General geometric good continuation: From Taylor to Laplace via levelsets**, *International Journal of Computer Vision (IJCV)*, 86(1), 48-71, 2010.
- [J14] A. Ben-Simon, O. Ben-Shahar, and R. Segev, **Measuring and Tracking Eye Movements of a Behaving Archer Fish by Real-Time Stereo Vision**, *The Journal of Neuroscience Methods (JNM)*, 184, 235-243, 2009.
- [J13] M. Lawlor, D. Holtman-Rice, P. Huggins, O. Ben-Shahar, and S.W. Zucker, **Boundaries, shading, and border ownership: A cusp at their interaction**, *Journal of Physiology-Paris*, 103(1-2), 18-36, 2009.
- [J12] A. Shapiro, E. Korkidi, A. Demri, O. Ben-Shahar, R. Riemer, and Y. Edan, **Toward Elevated Agrobotics: An Autonomous Field Robot for Spraying and Pollinating Date Palm Trees**, *Journal of Field Robotics (JFR)*, 26(6/7), 572-590, 2009.
- [J11] G. Ben-Yosef and O. Ben-Shahar, **Curvature-based perceptual singularities and texture saliency with early vision mechanisms**, *Journal of the Optical Society of America A (JOSA-A)*, 25(8), 1974-1993, 2008. Also selected for publication in the *Virtual Journal of Biomedical Optics*, Vol. 3(9), 2008, and the *Virtual Journal of Biological Physics Research*, August 15, 2008.
- [J10] O. Ben-Shahar, B.J. Scholl, and S.W. Zucker, **Attention, segregation, and textons: Bridging the gap between object-based attention and texton-based segregation**, *Vision Research*, 47(6), 845-870, 2007.
- [J9] A. Mokeichev, M. Okun, O. Barak, Y. Katz, O. Ben-Shahar, and I. Lampl, **Stochastic emergence of repeating cortical motifs in spontaneous membrane potential fluctuations *in vivo***, *Neuron*, 53, 413-425, 2007.
- [J8] O. Ben-Shahar, **Visual saliency and texture segregation without feature gradient**, *Proceedings of the National Academy of Sciences of the USA (PNAS)*, 103(42) 15704-15709, 2006.
- [J7] O. Ben-Shahar and S.W. Zucker, **Hue geometry and horizontal connections**, *Neural Networks*, 17 753-771, 2004.
- [J6] O. Ben-Shahar and S.W. Zucker, **Geometrical computations explain projection patterns of long range horizontal connections in visual cortex**, *Neural Computation*, 16(3) 445-476, 2004.
- [J5] O. Ben-Shahar and S.W. Zucker, **Sensitivity to curvature revealed in orientation-based texture segmentation**, *Vision Research*, 44(3) 257-277, 2004.
- [J4] O. Ben-Shahar and S.W. Zucker, **The perceptual organization of texture flow: A contextual inference approach**, *IEEE Transaction on Pattern Analysis and Machine Intelligence (PAMI)*, 25(4) 401-417, 2003.
- [J3] O. Ben-Shahar, P. Huggins, T. Izo, and S.W. Zucker, **Cortical connections and early visual function: Intra- and inter-columnar processing**, *Journal of Physiology-Paris*, 97(2-3), 191-208, 2003.

[J2] O. Ben-Shahar and Ehud Rivlin, **Practical pushing planning for rearrangement tasks**, *IEEE Transaction on Robotics (ITR)*, 14(4) 549-565, 1998.

[J1] O. Ben-Shahar and Ehud Rivlin, **On the rearrangement of movable objects by a mobile robot**, *IEEE Transaction on Systems, Man, and Cybernetics (ITSMC)*, 28(5) 667-679, 1998.

• **Conference articles (full length, rigorously peer reviewed papers)**

[C41] E. Barnea and O. Ben-Shahar, **Curve Reconstruction via the Global Statistics of Natural Curves**. In the *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, UT, USA, June 2018.

[C40] B. Arad and O. Ben-Shahar, **Filter Selection for Hyperspectral Estimation**, In the *Proceedings of the International Conference on Computer Vision (ICCV)*, Venice, Italy, October 2017.

[C39] S. Gur and O. Ben-Shahar, : **From Square Pieces to Brick Walls: The Next Challenge in Solving Jigsaw Puzzles**, In the *Proceedings of the International Conference on Computer Vision (ICCV)*, Venice, Italy, October 2017.

[C38] B. Arad and O. Ben-Shahar, **Sparse Recovery of Hyperspectral Signal from Natural RGB Images**, In the *Proceedings of the European Conference on Computer Vision (ECCV)*, Amsterdam, The Netherlands, October 2016.

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