

## Ohad Ben-Shahar

Department of Computer Science  
Yale University  
P.O. Box 208285  
New Haven, CT 06520  
Daytime phone: (203) 432-1227  
*ben-shahar@cs.yale.edu*  
*http://www.cs.yale.edu/~shahar*

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### Education

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| 2003 | <b>Ph.D.</b>                            | <b>Yale university</b> , New Haven, CT.<br>Department: Computer science<br>Thesis: <i>The Perceptual Organization of Visual Flows</i><br>Advisor: Steven W. Zucker                                   |
| 1999 | <b>M.Phil.</b>                          | <b>Yale university</b> , New Haven, CT.<br>Department: Computer science  |
| 1996 | <b>M.Sc.</b>                            | <b>Technion, Israel Institute of Technology</b> , Haifa, Israel.<br>Department: Computer science<br>Thesis: <i>On the Rearrangement of Movable Objects by a Mobile Robot</i><br>Advisor: Ehud Rivlin |
| 1989 | <b>B.Sc.</b> ( <i>summa cum laude</i> ) | <b>Technion, Israel Institute of Technology</b> , Haifa, Israel.<br>Department: Computer science   |
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### Research interest

Computer vision, computational models of biological vision, neurophysiology of the visual cortex, human perception and psychophysics, artificial intelligence (especially machine learning, neural networks, and computational aspects of robotics), and computer graphics.

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### Honors and awards

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| 1999      | Aspen International Design Conference. Winning team in the Mouse category.  |
| 1996      | The Gutwirth outstanding graduate student research award, Technion, Israel. |
| 1996      | Travel award, Computer society, IEEE.                                       |
| 1989      | B.Sc. <i>summa cum laude</i> , Technion, Israel.                            |
| 1986-1989 | President's list, Technion, Israel.   |

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## Research and Professional experience

- Sep 2003 - Present     **Postdoctoral Associate**, Dept. of Computer Science, Yale university, CT.  
Conduct research in computational vision, psychophysics of human perception, and computational neuroscience of visual processes.
- Jan 1997 - Aug 2003     **Research Assistant**, Dept. of Computer Science, Yale university, CT.  
Conducted research in biologically motivated computer vision and perceptual organization, psychophysics of human perception, and computational modeling of neurophysiological and anatomical aspects of primary visual cortex.
- Mar 1996 - Jan 1997     **R&D Engineer**, Elscint Corp., Haifa, Israel.  
Conducted R&D of medical imaging algorithms for nuclear medicine systems. Initiated a departmental-wide revision of software engineering and code development regulations.
- Mar 1994 - Mar 1996     **Research Assistant**, Dept. of Computer Science, Technion, Israel.  
Conducted research in motion and manipulation planning for mobile robots. Maintained the lab's mobile robotic infrastructure. Instructed and supervised projects by undergraduate and graduate students.
- Mar 1989 - Mar 1994     **Senior Software Engineer**, IDF (Israel Defense Force), Israel.  
Was in charge of the design and implementation of software architectures and system modules for the communication interface between several large scale systems (hundreds man-years). Guided and instructed programmers.
- Aug 1989 - Aug 1990     **Designer of Psychometric Tests**, Hatslaha (success), Tel-Aviv, Israel.  
Designed psychometric tests to be used in training and preparation of college applicants.

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## Teaching experience

- Oct 1997 - May 2003     **Teaching fellow**, Yale university, CT.  
Courses:    Artificial intelligence  
              Computational Vision and Biological Perception  
              Elements of computing  
              Introduction to Computer Science  
              Computer Science and the Modern Intellectual Agenda  
              Elementary and Advanced Hebrew
- Mar 1995 - Jan 1996     **Assistant Instructor**, The college of Management, Haifa branch, Israel.  
Courses:    Computer architecture
- Mar 1995 - Jan 1996     **Teaching fellow**, Department of Continuing Education, Technion, Israel.  
Courses:    Computer architecture
- Mar 1994 - Jan 1996     **Teaching fellow**, Department of Computer Science , Technion, Israel.  
Courses:    Computer architecture
- Oct 1987 - Feb 1989     **Instructor**, The Technological Manpower Program, Technion, Haifa, Israel.  
Courses:    Programming languages

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## Other professional activities

- **Ad hoc manuscript reviewing**

IEEE transaction on Pattern Analysis and Machine Intelligence (PAMI).  
International Conference on Computer Vision (ICCV).  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR).  
International Conference on Computer Analysis of Images and Patterns (CAIP).  
International Workshop on Biologically Motivated Computer Vision (BMCV).  
Asian Conference on Computer Vision (ACCV).

- **University and departmental service**

2000-2003 : Founding organizer, CVC Round Table, Yale university.  
2002-2003 : Coordinator, Vision Lunch seminar series, Yale university.  
2001-2002 : Web master, Center for Computational Vision and Control at Yale ([cvc.yale.edu](http://cvc.yale.edu)).  
1995-1996 : Students' project advisor, Center for Intelligent Systems, Technion, Israel.

- **Professional affiliation**

IEEE (member)

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## Publications

- **Theses**

O. Ben-Shahar, **The Perceptual Organization of Visual Flows**, Ph.D. Thesis, Yale University, New Haven, Connecticut, 2003.

O. Ben-Shahar, **To Push or Not to Push: On the Rearrangement of Movable Objects by a Mobile Robot**, M.Sc. Thesis, Technion, Haifa, Israel, 1996.

- **Refereed journal articles**

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.

O. Ben-Shahar and S.W. Zucker, **Sensitivity to Curvature Revealed in Orientation-Based Texture Segmentation**, *Vision Research* 44(3) 257-277, 2004.

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* 25(4) 401-417, 2003.

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.

O. Ben-Shahar and Ehud Rivlin, **Practical Pushing Planning for Rearrangement Tasks**, *IEEE Transaction on Robotics and Automation*, 14(4) 549-565, 1998.

O. Ben-Shahar and Ehud Rivlin, **On the Rearrangement of Movable objects by a Mobile Robot**, *IEEE Transaction on Systems, Man, and Cybernetics*, 28(5) 667-679, 1998.

- **Journal articles under review and in preparation**

**A Formal Good Continuation Model for General 2D Scalar Functions: Levelsets, Geometry, and Harmonic Maps**, (In preparation).

**A Complete Perceptual Organization Approach to Color Image Denoising**, (In preparation).

O. Ben-Shahar and S.W. Zucker, **Hues, Horizontal Connections, and Visual Cortex**, (Submitted).

O. Ben-Shahar, B.J.Scholl, and S.W. Zucker, **Bridging the Gap Between Object-Based Attention and Texton-Based Segmentation: How Attention Spreads Through Orientation Defined Textures**, (Submitted).

- **Conference and workshop articles**

O. Ben-Shahar and S.W. Zucker, **Hue Fields and Color Curvatures: A Perceptual Organization Approach to Color Image Denoising**, In the *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Wisconsin, June 2003.

B.J. Scholl, O. Ben-Shahar, and A. Marino, **What counts as an 'object' of object-based attention?**, *Annual meeting of the Psychonomic Society*, Vancouver, Canada, November 2003.

O. Ben-Shahar, B. Scholl, and S.W. Zucker, **Where objects come from: Attention, segmentation, and textons**, *The Journal of Vision*, 3(9), 474a, 2003. *The Annual meeting of the Vision Science Society*, Sarasota, Florida, May 2003.

O. Ben-Shahar, P. Huggins, and S.W. Zucker, **On Computing Visual Flows with Boundaries: The Case of Shading and Edges**, *2<sup>nd</sup> Workshop on Biologically Motivated Computer Vision*, Tübingen, Germany, November 2002. In Springer's *Lecture Notes in Computer Science*, Vol 2525, pp. 189-198, 2002.

O. Ben-Shahar and S.W. Zucker, **Curvature and the Perceptual Organization of Texture Flows**, *The Journal of Vision*, 2(7), 468a, 2002. *The Annual meeting of the Vision Science Society*, Sarasota, Florida, May 2002.

O. Ben-Shahar and S.W. Zucker, **On the Perceptual Organization of Texture and Shading Flows: From a Geometrical Model to Coherence Computation**, In the *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Hawaii, December 2001.

O. Ben-Shahar and S.W. Zucker, **Flowing toward coherence: On the geometry of texture and shading flow**, *The third workshop on Perceptual Organization in Computer Vision*, Vancouver, Canada, July 2001.

G. Hager and D. Kriegman and A. Georghiadis and O. Ben-Shahar, **Towards Domain Independent Navigation: Dynamic Vision and Control**, In the *Proceedings of the IEEE Conference on Decision and Control*, 1998.

O. Ben-Shahar and Ehud Rivlin, **To Push or not to Push II: Practical Pushing Planning for Rearrangement Tasks**, In the *Proceedings of the IEEE Conference on Robotics and Automation*, 1996.

O. Ben-Shahar and Ehud Rivlin, **To Push or not to Push I: On the Rearrangement of Movable objects by a Mobile Robot**, In the *Proceedings of the IEEE Conference on Robotics and Automation*, 1996.

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## References

**Steven W. Zucker**

Department of Computer Science  
Yale university  
P.O.Box 208285  
New Haven, CT 06520-8285  
203-432-6434  
Steven.Zucker@yale.edu

**Brian Scholl**

Department of Psychology  
Yale university  
P.O.Box 208205  
New Haven, CT 06520-8205  
203-432-4629  
Brian.scholl@yale.edu

**Michael P. Stryker**

Department of Physiology  
University of California  
UCSF Box 0444  
San Francisco, CA 94143-0444  
415-476-5443  
stryker@phy.ucsf.edu

**Michael Lindenbaum**

Department of Computer Science  
Technion,  
Technion City  
Haifa 32000, Israel  
+972-4-8294331  
mic@cs.technion.ac.il

**Drew McDermott**

Department of Computer Science  
Yale university  
P.O.Box 208285  
New Haven, CT 06520-8285  
203-432-1284  
McDermott@cs.yale.edu

**Ehud Rivlin**

Department of Computer Science  
Technion,  
Technion City  
Haifa 32000, Israel  
+972-4-8294304  
ehudr@cs.technion.ac.il