

## ASSAF HAREL, PHD CURRICULUM VITAE

Department of Psychology  
Wright State University

### Contact Details

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437 Fawcett Hall  
3640 Colonel Glenn Highway  
Dayton, Ohio 45435

Email: [assaf.harel@wright.edu](mailto:assaf.harel@wright.edu)  
Website: <https://people.wright.edu/assaf.harel>  
Tel: (937) 775-3819  
Cell: (240) 938-4020

### Professional Experience

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**2014 – Present**      **Wright State University**

Assistant Professor, Department of Psychology

**2014**                      **National Institute of Mental Health (NIMH), NIH**

Research fellow, Unit on Learning and Plasticity, Laboratory of Brain and Cognition

**2009 – 2014**              **National Institute of Mental Health (NIMH), NIH**

Post-doctoral visiting fellow, Unit on Learning and Plasticity, Laboratory of Brain and Cognition

### Education and Training

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**2004 – 2009**              **Hebrew University of Jerusalem**

PhD in Cognitive Neuropsychology

Thesis: *“What is special about expertise? A neuroanatomical and electrophysiological investigation of visual expert object recognition”*

Advisor: Prof. Shlomo Bentin. Awarded May 2009.

**2002 – 2004**              **Hebrew University of Jerusalem**

MA Summa Cum Laude in Cognitive Neuropsychology

**1999 – 2002**              **Tel Aviv University**

BA in Psychology and Mass Communications

**2003**              The Vivian Smith Advanced Studies Summer Institute of the International Neuropsychological Society

## Grants and Academic Awards

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- 2016** Faculty Research Incentives Internal Program, Wright State University Office of the Vice President for Research
- 2016** Office of Naval Research Small Business Research Innovation Phase II grant: "*A Study to Measure Training Effectiveness of a Computer-Based Trainer*" (UtopiaCompression Corporation, academic consultant)
- 2016** DARPA Targeted Neuroplasticity Training (TNT) BAA (DARPA-BAA-16-24): "*Learning through Electrical Augmentation of Plasticity (LEAP)*" (Wright State Research Institute, Co-PI)
- 2016** Air Force Research Laboratory Human Performance Sensing BAA (AFRL RQKHB-2015-0003): "*System for Assessing Complex Contextual Attention and Dynamic Engagement (SACCADE)*" (Lockheed Martin Advanced Technology Laboratories, Co-PI)
- 2016** Office of Naval Research BAA (BAA N00014-16-R-BA01): "*The Role of Dynamic Representational Networks in Expertise in Visual Scene Recognition*" (PI)
- 2015** Office of Naval Research BAA (ONR-BAA-15-001): "*Lapses of Attention Predicted in Semi-structured Ecological Settings*" (Wright State Research Institute, Co-PI)
- 2013** NIH Fellows Award for Research Excellence
- 2008** Golda Meir Foundation fellowship
- 2007** Israel Foundations Trustees Research Grant for Doctoral Students
- 2006** Sturman Travel Award, Psychology Department of the Hebrew University
- 2005** Excellence scholarship for PhD students of the Hebrew University Social Sciences faculty
- 2004** Hebrew University Rector Award for Outstanding Academic Achievements
- 2004** Israeli Parliament (Knesset) Award for Outstanding Academic Achievements
- 2002** PhD Scholarship from the Department of Psychology, Hebrew University of Jerusalem

## Teaching

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- 2014 – Wright State University**  
Professor, courses taught: Introduction to Cognitive Neuroscience; Methods in Cognitive Neuroscience; Advanced Topics in Cognitive Neuroscience
- 2011 – 2012 National Institutes of Health**  
Guest lecturer, Science Skills seminar (Post-baccalaureate Intramural Research Training)
- 2007 – 2008 Hebrew University of Jerusalem**  
Tutor of Psychology, Equal Opportunities program
- 2002 – 2006 Hebrew University of Jerusalem**  
Teaching assistant, "*Research Methods in Experimental Psychology*" course
- 2002 – 2005 Tel Aviv University**  
Lecturer, "*Artificial Intelligence*" distant learning course for gifted students

## Clinical Experience

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### **2001-2002 Tel Aviv University**

Field work with mentally ill in the Sourasky Medical Center, Tel Aviv

## Military Service

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### **1996 – 1999 Israel Defense Force**

Civil affairs coordinator, Israel-Lebanon liaison unit

## Membership in Scientific Societies

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Association for Psychological Science, Society For Neuroscience, Vision Sciences Society, Cognitive Neurosciences Society, Israeli Society for Neuroscience

## Ad-hoc reviewer

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### Funding Agencies

National Science Foundation (NSF)

Israel Science Foundation (ISF)

Research Foundation Flanders (FWO)

Austrian Science Fund (FWF)

Wellcome Trust, United Kingdom

### Scientific Journals

*Brain Research, Cerebral Cortex, Cognition, Cortex, Current Direction in Psychological Science, European Journal of Neuroscience, Frontiers in Human Neuroscience, Frontiers in Perception Science, Journal of Cognitive Neuroscience, Journal of Experimental Psychology: Human Perception & Performance, Journal of Neurophysiology, Journal of Neuroscience, Journal of Neuroscience Methods, Journal of Vision, Nature Communications, Nature Neuroscience, Neuroinformatics, Neuron, Neuropsychologia, PLoS ONE, Trends in Cognitive Sciences*

## Publications

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### Book Chapters

- 1) **Harel, A.** (2015). A neurocognitive approach to expertise in visual object recognition. In: Schmorrow, D. D., and Fidopiastis, C. C. (Eds.). *Foundations of Augmented Cognition (Springer Lecture Notes in Artificial Intelligence Vol. 9183)*. Springer International Publishing, Switzerland.
- 2) **Harel, A.** and Baker, C. I. (2014). Imaging perception. In: Mulert, C., and Shenton, M. (Eds.). *MRI in Psychiatry*. New York, NY: Springer.

## Articles

- 3) Sestito, M., **Harel, A.**, Nador, J. & Flach, J. (under review). Investigating neural sensorimotor mechanisms underlying flight expertise in pilots: an EEG study.
- 4) Hansen, N., **Harel, A.**, Iyer, N. Simpson, B., & Wisniewski, M. (under review). The Phase of Spontaneous Pre-Stimulus EEG Oscillations Predicts Auditory Pattern Identification.
- 5) Balas, B., Auen, A., Schmidt, J., & **Harel, A.** (under review). Sensitivity to face features of intermediate complexity during childhood.
- 6) Sestito, M., Flach, J., & **Harel, A.** (2018). Grasping the world from a cockpit: Ecological perspectives on embodied neural mechanisms underlying human performance and ergonomics in aviation context. *Theoretical Issues in Ergonomics Science*, 1-20.
- 7) Zhang, H., Houpt, J., & **Harel, A.** (2018). Establishing reference scales for scene naturalness and openness. *Behavior Research Methods*, 1-8.
- 8) Hansen, N., Noesen, B., Nador, J., & **Harel, A.** (2018). The influence of behavioral relevance on the processing of global scene properties: An ERP study. *Neuropsychologia*, 114, 168-180.
- 9) Hebart, M. N., Bankson, B. B., **Harel, A.**, Baker, C. I., & Cichy, R. M. (2018). The representational dynamics of task and object processing in humans. *eLife*, 7, e32816.
- 10) Fox, O. M., **Harel, A.**, and Bennett, K. B. (2017). How configural is the configural superiority effect? A neuroimaging investigation of emergent features in visual cortex. *Frontiers in Psychology (Perception Science)*, 8 (32).
- 11) **Harel, A.** (2017). Event-Related Potentials Reveal the Early Time Signatures of Visual Scene Perception. *NeuroOnline*. <http://neuroonline.sfn.org/Articles/Scientific-Research/2017/Event-Related-Potentials-Reveal-the-Early-Time-Signatures-of-Visual-Scene-Perception>.
- 12) **Harel, A.**, Groen, I. A., Kravitz, D. J., Deouell, L. Y., and Baker, C. I. (2016). The temporal dynamics of scene processing: A multi-faceted EEG investigation. *eNeuro*. 3(5), ENEURO-0139.
- 13) **Harel, A.** (2016). What is special about expertise? Visual expertise reveals the interactive nature of real-world object recognition. *Neuropsychologia* 83, 88-99.
- 14) **Harel, A.**, Kravitz, D. J. and Baker, C. I. (2014). Holding the stick at both ends: On faces and expertise. *Frontiers in Human Neuroscience* 442.
- 15) **Harel, A.**, Kravitz, D. J. and Baker, C. I. (2014). Task context impacts visual object processing differentially across the cortex. *Proceedings of the National Academy of Sciences of the United States of America* 111(10), E962-E971.
- 16) Golan, T., Bentin, S., DeGutis, J. M., Robertson, L. C., & **Harel, A.** (2014). Association and dissociation between detection and discrimination of objects of expertise: evidence from visual search. *Attention, Perception, & Psychophysics*, 76, 391-406.
- 17) **Harel, A.**, Kravitz, D. J., and Baker, C. I. (2013). Beyond perceptual expertise: Revisiting the neural substrates of expert object recognition. *Frontiers in Human Neuroscience* 7, 885.

- 18) **Harel, A.**, and Bentin, S. (2013). Are all types of expertise created equal? Car experts use different spatial frequency scales for subordinate categorization of cars and faces. *PLoS ONE*. 8(6): e67024.
- 19) **Harel, A.**, Kravitz, D. J., and Baker, C. I. (2013). Deconstructing visual scenes in cortex: gradients of object and spatial layout information. *Cerebral Cortex*, 23(4), 947-957.
- 20) Gillaie-Dotan, S.\*, **Harel, A.\***, Bentin, S., Kanai, R., and Rees, G. (2012). Neuroanatomical correlates of visual car expertise. *NeuroImage*, 62, 147-153.

#### **\*Equal contribution**

- 21) **Harel, A.**, Ullman, S., Harari, D., and Bentin, S. (2011). Basic-level categorization of intermediate complexity fragments reveals top-down effects of expertise in visual perception. *Journal of Vision*, 11(8), 1-13.
- 22) **Harel, A.**, Gillaie-Dotan, S., Malach, R., and Bentin, S. (2010). Top-down engagement modulates the neural expressions of visual expertise. *Cerebral Cortex*, 20(10), 2304-2318.
- 23) **Harel, A.**, and Bentin, S. (2009). Spatial frequencies needed for categorization of faces and objects vary with stimulus type and level of categorization. *Journal of Experimental Psychology: Human Perception and Performance*, 35(4), 1264-1273.
- 24) Gao, L., Jing X., Zhang, B., Zhao, L., **Harel, A.**, and Bentin, S. (2009). Aging effects on early-stage face perception: an ERP study. *Psychophysiology*, 46(5), 970-983.
- 25) **Harel, A.**, Ullman, S., Epshtein, B., and Bentin, S. (2007). Mutual information of image fragments predicts categorization in humans: Electrophysiological and behavioral evidence. *Vision Research*, 47, 2010-2020.

#### **Invited Talks**

- **Second International Neuroergonomics Conference, 2018.** Uncovering the temporal dynamics of scene understanding using Event-Related Potentials.
- **Second International Neuroergonomics Conference, 2018.** Grasping the world from a cockpit: investigating embodied neural mechanisms underlying human performance and ergonomics in aviation context (Given by M. Sestito).
- **Second International Neuroergonomics Conference, 2018.** Assessment of Top-Down Attention for a Closed-Loop Performance Enhancement System Using High-Frequency Steady-State Visually Evoked Potentials and Eye Tracking (Given by M. Pava).
- **Seventh Annual Midwest Cognitive Science Conference.** Neural Markers of Switch-Cost Predict Cognitive Demand Avoidance (Given by J. Nador).
- **Philips Medical Systems Technologies, Advanced Technological Center, Haifa (Israel), 2017.** Neuroergonomics: Harnessing Cognitive Neuroscience to Enhance Human Performance and HMI.
- **Midwestern Conference on Cognitive Science, 2017.** Uncovering the temporal dynamics of scene processing using Event-Related Potentials.

- **College of Design, Architecture, Art and Planning (DAAP), University of Cincinnati, 2017.** Harnessing Space: How Does The Human Brain Represent Information About Visual Scenes?
- **Department of Psychology, Wright State University, 2017.** Behavioral relevance impacts utilization of diagnostic information for scene categorization at multiple time windows: Behavioral and electrophysiological evidence
- **Annual Meeting of the Society for Neuroscience, 2016.** Decoding the temporal evolution of task and stimulus-related brain signals (Given by M. N. Hebart)
- **Grand Rounds, Department of Neurology, Wright State University Boonshoft School of Medicine, 2016.** Unraveling the spatiotemporal dynamics of visual scene recognition: Neuroimaging and electrophysiological evidence.
- **Annual meeting of the Israeli Society For Neuroscience, 2015.** Early signatures of scene selectivity: A multi-faceted EEG investigation.
- **HCI International, Los Angeles, 2015 (9<sup>th</sup> International Conference on Augmented Cognition).** A Neurocognitive Approach to Expertise in Visual Object Recognition.
- **Midwest Cognitive Science Conference, 2015.** Early signatures of scene processing: A multi-faceted EEG investigation.
- **Health and Human Performance Research Summit, Dayton, 2015.** Beyond Perceptual Expertise: Revisiting the Neural Substrates of Expert Object Recognition.
- **Department of Psychology, Wright State University, 2014.** Early signatures of scene processing: A multi-faceted EEG investigation.
- **Department of Psychology, Durham University, 2014.**
- **Department of Psychology, Florida Atlantic University, 2014.** Moving beyond the visual in visual object recognition: Lessons from expertise and task effects.
- **Department of Psychology, Wright State University, 2014.** Moving beyond the visual in visual object recognition: Lessons from expertise and task effects.
- **Department of Psychology, Tel Aviv University, 2013.** Moving beyond the visual in visual object recognition: Lessons from expertise and task effects.
- **Department of Neurobiology, Weizmann Institute of Science, 2012.** Moving beyond category-selectivity: What can fMRI tell us about large-scale interactions in vision?
- **Annual meeting of the Society For Neurosciences, 2012.** How perceptual is perceptual expertise? Neural and behavioral evidence for the involvement of top-down factors in visual expertise.
- **Annual meeting of the Visual Sciences Society, 2012.** Task-dependent representations of visual objects.
- **Annual Meeting of the Israeli Society For Neuroscience, 2011.** Deconstructing visual scenes in cortex: gradients of object and spatial layout information.
- **Psychology department, Ben Gurion University, 2011.** Moving beyond modularity: Large-scale interactive processing in vision.
- **Psychology department, Haifa University, 2011.** Moving beyond modularity: Large-scale interactive processing in vision.
- **Neurobiology department, Haifa University, 2011.** Moving beyond modularity: Large-scale interactive processing in vision.



- **NIH fMRI Principal Investigators seminar series, 2011.** What's in a scene? Interactions between objects and space in human visual cortex.
- **Center for Mind and Brain, UC Davis, 2010.** How perceptual is perceptual expertise? Re-evaluating the neural and behavioral correlates of visual expertise.
- **Combined Whitney-Silver-Palmer-Prinzmetal-Robertson lab meeting, UC Berkeley, 2010.** How perceptual is perceptual expertise? Re-evaluating the neural and behavioral correlates of visual expertise.
- **Annual meeting of the Visual Sciences Society, 2010.** Top-Down engagement modulates the neural expressions of visual expertise.
- **Annual meeting of Tel Aviv Human Brain Mapping Meeting, 2008.** The neural substrates of visual expertise revisited.
- **Annual meeting of the Interdisciplinary Center for Neural Computation of the Hebrew University, 2008.** Expertise-related activity in the Fusiform Face Area is modulated by level of engagement and expertise.
- **Annual meeting of the Israeli Society for Neuroscience, 2007.** Is it a European car or a Japanese car? An ERP study of diagnostic information use in visual expertise.
- **Workshop on Electrophysiological Manifestation of Face Processing: Methodology and Interpretation, 2007.** Basic and subordinate level categorization of faces and cars: The effects of expertise and spatial frequency scales.
- **Annual meeting of the Interdisciplinary Center for Neural Computation of the Hebrew University, 2006.** The psychological reality and neural basis of features of intermediate complexity in object categorization.
- **Psychology department, Vanderbilt University, 2005.** Further explorations of expert object recognition.

### Conference Posters

- Nador, J., Harel, A., Juvina, I., & Minnery, B. (2018). EEG Correlates of Working Memory Predict Gaze Variability during a Real-World Information Foraging Task. *Second International Neuroergonomics Conference*.
- Borders, J., Noesen, B., Dennis, B., & Harel, A. (2018). Using behavioral and neural measures to assess training in scene categorization. *Second International Neuroergonomics Conference*.
- Hansen, N. E., Wisniewski, M. G., Iyer, N., Simpson, B. D., & Harel, A. (2018). The Phase of Spontaneous Pre-stimulus EEG Oscillations Predicts Auditory Pattern Identification. *Second International Neuroergonomics Conference*.
- Harel, A., Fox, O.M., Hansen, N., Galego, B., Pava M. & Russell, B. (2018). EEG & Eye-Tracking Changes With Expertise In A Multi-Vehicle Control Task. *Second International Neuroergonomics Conference*.
- Nador, J. D., Juvina, I., Minnery, B. & Harel, A. (2018). Neural Markers of Switch-Cost Predict Cognitive Demand Avoidance. *Annual meeting of the Vision Sciences Society*.
- Noesen, B. T., Borders, J. D., & Harel, A. (2018). Training expertise in scene recognition. *Annual meeting of the Vision Sciences Society*.

- Borders, J. D., Noesen, B. T., & Harel, A. (2018). Electrophysiological Evidence for the Tripartite Organization of the Ventral Stream by Animacy and Object Size. *Annual meeting of the Vision Sciences Society*.
- Harel, A. Nador, J. D., Bonner, M. F., Epstein, R. A., (2018). Early electrophysiological markers of navigational affordances in scenes. *Annual meeting of the Vision Sciences Society*.
- Noesen, B. T., Borders, J. D., & Harel, A. (2018). Training expertise in scene recognition. *Seventh Annual Midwest Cognitive Science Conference*.
- Borders, J. D., Noesen, B. T., & Harel, A. (2018). Electrophysiological Evidence for the Tripartite Organization of the Ventral Stream by Animacy and Object Size. *Seventh Annual Midwest Cognitive Science Conference*.
- Harel, A. Nador, J. D., Bonner, M. F., Epstein, R. A., (2018). Early electrophysiological markers of navigational affordances in scenes. *Seventh Annual Midwest Cognitive Science Conference*.
- Hansen, N. E., Wisniewski, M. G., Iyer, N., Simpson, B. D., & Harel, A. (2017). Do oscillatory dynamics of pre-stimulus EEG predict trial-by-trial fluctuations in auditory pattern identification? *The 6th International Conference on Auditory Cortex*.
- Noesen, B. & Harel, A. (2017). Categorization specificity and semantic content impact the deployment of spatial attention. *Annual Meeting of the Vision Sciences Society*.
- Nador, J., Minnery, B., Sherwood, M., Harel, A. & Juvina, I. (2017). Working Memory Capacity and Cognitive Filtering Predict Demand Avoidance. *Annual meeting of the Vision Sciences Society*.
- Mzozoyana, M. W., Lowe, M. X., Groen, I. A. A., Cant, J. S. & Harel, A. (2017). Artificially-generated scenes demonstrate the importance of global scene properties for scene perception. *Annual Meeting of the Vision Sciences Society*.
- Hebart, M., Bankson, B. B., Harel, A., Baker, C. I., & Cichy, R. M. (2017). MEG decoding reveals the representational dynamics of task context in visual processing. *Annual Meeting of the Vision Sciences Society*.
- Harel, A. & Artz, N. (2017). Perceptual Properties of Scenes Determine Their Subsequent Memory. *Annual Meeting of the Vision Sciences Society*.
- Hansen, N., Noesen, B., & Harel, A. (2017). Behavioral relevance impacts utilization of diagnostic information for scene categorization at multiple time windows: Electrophysiological evidence. *Annual Meeting of the Vision Sciences Society*.
- Harel, A. (2017). Uncovering the temporal dynamics of scene processing using Event-Related Potentials. *Second Global Brain Health and Performance Summit, Ohio State University*.
- Artz, E. N., & Harel, A. (2017). Perceptual Properties of Scenes Determine Their Subsequent Memory. *Midwest Psychological Association Annual Meeting*.
- Hanshu, Z., Houpt, J. W., & Harel, A. (2016), Linear Ranking Scales of Naturalness and Openness of Scenes. *Annual Meeting of the Psychonomic Society*.
- Noesen, B., Hansen, N., Ewald, J., & Harel, A. (2016). Does Task Relevance Modulate The Scene Sensitive P2 Component? *Object Perception, Attention, and Memory Annual Workshop*.



- Nador, J., Minnery, B., Sherwood, M., Green, R., Harel, A., & Juvina, I. (2016). Working Memory Capacity and Cognitive Filtering Predict Demand Avoidance. *Object Perception, Attention, and Memory Annual Workshop*.
- Fox, O. M., Harel, A., Bennet, K. B. (2016). How configural is the configural superiority effect? a neuroimaging investigation of configurality in visual cortex. *Annual meeting of the Society For Neuroscience*.
- Harel, A., Kravitz, D. J., and Baker, C. I. (2016). Impact Of Top-Down Cognitive Factors On Neural Representations Of Objects In Human Visual Cortex. *Global Brain Health and Performance Summit, Ohio State University*.
- Harel, A., Groen, I. A. A., Kravitz, D. J., Deouell, L. Y. and Baker, C. I. (2014). The time course of scene processing: A multi-faceted EEG investigation. *Annual meeting of the Society For Neuroscience*.
- King, M., Harel, A., Kravitz, D. J., and Baker, C. I. (2014). Impact of task context on the cortical representations of real-world scenes. *Annual meeting of the Society For Neuroscience*.
- Harel, A., Kravitz, D. J., and Baker, C. I. (2014). Beyond perceptual expertise: Revisiting the neural substrates of expert object recognition. *Annual meeting of the Visual Sciences Society*.
- Harel, A., Kravitz, D. J., Deouell, L.Y., and Baker, C. I. (2014). The time course of scene processing: evidence from event-related potentials. *Annual meeting of the Society For Cognitive Neuroscience*.
- King, M., Harel, A. Kravitz, D. J., and Baker, C. I. (2014). Impact of task on the cortical representations of real-world scenes. *Annual meeting of the Society For Cognitive Neuroscience*.
- Harel, A. Kravitz, D. J., and Baker, C. I. (2013). The pervasive impact of top-down signals: Task context determines the neural representations of objects. *Annual meeting of the Society For Neuroscience*.
- Harel, A. Kravitz, D. J., and Baker, C. I. (2012). Task-dependent representations of visual objects in occipito-temporal cortex. *Concepts, Actions and Objects: Functional and Neural Perspectives workshop, Center for Mind/Brain Sciences (CIMeC), University of Trento, Italy*.
- Harel, A. Kravitz, D. J., and Baker, C. I. (2011). Dissociating object and space representations in scene-selective visual cortex. *Annual meeting of the Visual Sciences Society*.
- Harel, A. Kravitz, D. J., and Baker, C. I. (2011). What's in a Scene? Interactions between Objects and Space in Human Visual Cortex. *Scene Understanding Symposium, MIT*.
- Harel, A. Kravitz, D. J., and Baker, C. I. (2010). Representing objects, backgrounds and scenes along the ventral visual pathway. *Annual meeting of the Society For Neuroscience*.
- Harel, A., and Bentin, S. (2008). Are all types of expertise created equal? Expert categorization of cars and faces relies on different spatial frequency scales. *Annual meeting of the Visual Sciences Society*.

- Harel, A., Ullman, S., Epshtein, B., and Bentin, S. (2006). The psychological reality and neural correlates of intermediate complexity features in perceptual categorization. *Annual meeting of the Visual Sciences Society*.
- Harel, A., Ullman, S., Epshtein, B., and Bentin, S. (2005). Intermediate complexity features support object classification. *Annual meeting of the Israeli Society for Neuroscience*.
- Harel, A., Golland, Y., Malach, R. and Bentin, S. (2005). What is special about expertise? Selective neural response to objects of expertise in experts' ventral visual pathway? *Annual meeting of the Cognitive Neuroscience Society*.
- Harel, A., Golland, Y., Malach, R. and Bentin, S. (2005). Neuroimaging evidence for visual expertise: What does it tell us? *Annual meeting of the Israeli Neuropsychological Society*.
- Harel, A., Golland, Y., Malach, R. and Bentin, S. (2004). Selective neural responses to objects of expertise in experts' ventral visual pathway. *Annual meeting of the Israeli Society for Neuroscience*.