# DIRK BERNHARDT-WALTHER

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*(last revised: April 14, 2025)*

## POSITIONS

| | |
|---|---|
| 2024 – present | Program Director of Cognitive Science at University College, University of Toronto |
| 2019 – present | Associate Professor, Department of Psychology, University of Toronto (St. George) |
| 2014 – present | Associate Scientist (cross-appointment), Rotman Research Institute, Toronto, Canada |
| 2022 – 2023 | Interim Director, Toronto NeuroImaging Facility (ToNI) |
| 2019 – 2020 | Visiting Professor, Samsung Artificial Intelligence Center, Toronto, Canada |
| 2014 – 2019 | Assistant Professor, Department of Psychology, University of Toronto (St. George) |
| 2012 – 2014 | Associate Director, Center for Cognitive and Brain Sciences, The Ohio State University |
| 2010 – 2014 | Assistant Professor, Department of Psychology, The Ohio State University |
| 2009 – 2010 | Postdoctoral Research Associate, Beckman Institute, University of Illinois at Urbana-Champaign |
| 2006 – 2009 | Beckman Postdoctoral Fellow, Beckman Institute, University of Illinois at Urbana-Champaign |
| 2006 | Postdoctoral Fellow, Centre for Vision Research, York University, Toronto, ON |
| 1999 – 2000 | Research Consultant, Lucent Technologies Bell Laboratories, Murray Hill, NJ |

## EDUCATION

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|---|---|
| 2006 | Ph.D., Computation and Neural Systems, California Institute of Technology<br>Advisors: Dr. Christof Koch, Dr. Pietro Perona |
| 1999 | M.Phil., Physics, Trinity College, University of Cambridge, Cambridge, UK<br>Advisor: Dr. Howard P. Hughes. |
| 1995 – 1998 | Undergraduate studies in Physics and Computer Science, Universität Leipzig, Leipzig, Germany, Vordiplom in Physics (1997) and in Computer Science (1998) |

## ACADEMIC HONORS AND FELLOWSHIPS

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|---|---|
| 2019 | Appointed Senior Member of the Institute of Electrical and Electronics Engineers |
| 2017 | SONY Faculty Research Award |
| 2015 | Connaught New Researcher Award, Connaught Fund, University of Toronto |
| 2012 | Fred Brown Research Award for best research paper: Department of Psychology, The Ohio State University |

2006 – 2009 Beckman Postdoctoral Fellowship, University of Illinois at Urbana-Champaign

2007 Conference Travel Award for Computational and Systems Neuroscience (Cosyne)

2007 Conference Travel Award for Grand Challenges in Neural Computation

2005 – 2006 Pre-doctoral Fellowship, Sloan-Swartz Center for Theoretical Neuroscience, California Institute of Technology

2005 Best Poster Presentation Award at the Joint Symposium on Neural Computation, University of California Los Angeles

2004 Best Poster Presentation Award at the International Conference on Computer Vision and Pattern Recognition, Washington, D.C.

2000 – 2001 Milton E. Mohr Graduate Fellowship, California Institute of Technology

1996 – 2001 Fellow of the Studienstiftung des deutschen Volkes (German National Scholarship Foundation)

## GRANTS

2023 – 2028 PI, Insight Grant (Ref. 435-2023-0015)
Social Sciences and Humanities Research Council of Canada (SSHRC)
Title: The role of perceptual grouping in the aesthetic pleasure of viewing real-world scenes; Research Support: CAD 376,409

2023 – 2025 Collaborator (PI: Peter Kohler), VISTA Research Grant, York University
Title: Marmoset Responses to Mid-level Visual Features investigated with Natural and Artificial Stimuli; Research Support: CAD 51,300

2023 – 2024 Collaborator (PI: Enric Munar), Proyectos de Generación de Conocimiento 2022
Ministerio de Ciencia e Innovación, Government of Spain (PID2022-137512NB-I00)
Title: The psychophysiological basis of the preference for curvature
Research Support: EUR 106,000

2020 – 2026 PI, Discovery Grant (RGPIN-2020-04097)
Natural Sciences and Engineering Research Council of Canada (NSERC)
Title: Computational and neural mechanisms of perceptual grouping
Research Support: CAD 235,000

2019 – 2021 PI (with Michael Grüninger), XSeed Grant
Faculty of Arts and Science, Faculty of Engineering, University of Toronto
Title: From Pixels to Propositions: Using Knowledge-based Grouping to Bridge the Meaning Gap in Visual Perception
Research Support: CAD 120,000

2017 – 2019 PI, Insight Development Grant (430-2017-01189),
Social Sciences and Humanities Research Council of Canada (SSHRC)
The role of symmetry in the aesthetic pleasure of viewing real-world scenes
Research support: CAD 74,733

2017 – 2018 PI, Sony Faculty Research Award, Sony Electronics Inc.
*Symmetry: A Guiding Principle in Visual Processing*
Research support: CAD 62,260

2015 – 2020 PI, Discovery Grant (RGPIN-2015-06696),
Natural Sciences and Engineering Research Council of Canada (NSERC)

*Neural mechanisms of perceiving dynamic real-world environments*
Research support: CAD 120,000

2015 – 2017 PI, Connaught New Researcher Award, Connaught Fund, University of Toronto
*Disentangling influences on the perception of real-world scenes in time and space*
Research support: CAD 9,944.72

2015 – 2018 PI, John R. Evans Leaders Fund (Project Number 32896)
*Neural mechanisms of natural scene perception*, Research support:
Canadian Foundation for Innovation: CAD 100,000
Ontario Research Fund: CAD 100,000
University of Toronto: CAD 34,383

2014 – 2019 co-PI (PI: Vladimir Sloutsky), National Institute for Child Health and Human Development (HD078545-A1, R01), *The Development of Categorization*
Research support: USD 1,925,000.00

2011 – 2013 PI, Seed Grant, Center for Cognitive Science, The Ohio State University
*Eye movements as an objective measure of categorization performance*
Research support: USD 26,838

2008 – 2013 co-PI (PI: Fei-Fei Li), National Eye Institute (NIH 1 R01 EY019429),
*CRCNS: fMRI Pattern Analysis of Neural Correlates of Natural Scenes Categories*
Research support: USD 1,302,157

2008 – 2010 co-PI (PI: Mark Hasegawa-Johnson), National Science Foundation
(NSF 0803219, RI-medium),
*Audio Diarization - Towards Comprehensive Description of Audio Events*
Research support: USD 249,864

2002 – 2003 PI, Seed Grant, Institute for Neuromorphic Engineering
*Detection of visual events in underwater video using a neuromorphic saliency-based attention system,* Research support: USD 5,000

## TEACHING EXPERIENCE

Undergraduate courses:

PSY 198: The Psychology of Magic. In this first-year seminar I discuss the psychological basis of magic tricks and use magic to explore aspects of psychology.
Winter 2019, Winter 2021 (online), Winter 2022 (hybrid), Winter 2023, Winter 2024

PSY 280: Sensation and Perception. Responsible for all elements of course design, including course outline, essay assignments, lecture preparation, and exam development.
Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2020 (online), Fall 2021 (online), Fall 2022 (online), Fall 2023 (online), Spring 2024 (online), Fall 2024 (online), Winter 2025 (online), Spring 2025 (online)

PSY 380: Vision Science. Vision Research from the perspective of psychology, neuroscience, and computer science. Responsible for all elements of course design, including course outline, reading list, essay assignments, lecture preparation, and exam development.
Fall 2016, Fall 2018, Winter 2021 (online), Winter 2024, Winter 2025

PSY 480: Seminar on Natural Scene Perception. Responsible for all elements of course design, including course outline, reading list, essay assignments, lecture preparation, and exam development. Winter 2015
Seminar on the Neuroscience of Aesthetics. Responsible for all elements of course design, including course outline, reading list, essay assignments, lecture preparation, and exam development. Fall 2023

Graduate courses:

PSY 5212: Functional MRI of the Human Visual System. Responsible for all elements of course design, including course outline, computational scripts, homework assignments, lecture preparation and design and evaluations of final projects. Winter 2018

PSY 3100: Machine Learning for Psychological Research. Responsible for all elements of course design, including course outline, computational scripts, homework assignments, lecture preparation and design and evaluations of homework assignments.
Winter 2022, Fall 2022

## PUBLICATIONS

*Google Scholar Profile: https://scholar.google.ca/citations?user=rnps4mgAAAAJ&hl=en*

1. Moaz Shoura, **Dirk B. Walther**, and Adrian Nestor (2025) Unraveling other-race face perception with GAN-based image reconstruction, *Behavior Research Methods* 57 (4), 1-14. https://doi.org/10.3758/s13428-025-02636-z
2. Oshin Vartanian, Delaram Farzanfar, **Dirk B. Walther**, Pablo P. L. Tinio (2025) Where creativity meets aesthetics: The Mirror Model of Art revisited with fMRI, *Neuropsychologia* 212, 109127. https://doi.org/10.1016/j.neuropsychologia.2025.109127
3. Jiongtian Guo, Jay Pratt, and **Dirk B. Walther** (2025) No evidence for a privileged role of global ensemble statistics in rapid scene perception: A registered replication attempt. *Attention Perception and Psychophysics* 87, 685–697. https://doi.org/10.3758/s13414-024-02994-4
4. Oshin Vartanian, Delaram Farzanfar, Enric Munar, Martin Skov, Gregor Hayn-Leichsenring, Pik Ki Ho, and **Dirk B. Walther** (2024) Neural dissociation between computational and perceived measures of curvature, *Scientific Reports*, 14, 26529. https://doi.org/10.1038/s41598-024-76931-8
5. Zach Buck, Everan Michalchyshyn, Amna Nishat, Mikayla Lisi, Yichen Huang, Hanyu Liu, Arina Makarenka, Charles Puttcharnun Plyngam, Abigail Windle, Zhen Yang, **Dirk B. Walther** (2024) Aesthetic processing in neurodiverse populations, *Neuroscience & Biobehavioral Reviews*, Volume 166, 105878, https://doi.org/10.1016/j.neubiorev.2024.105878
6. Charlotte A. Leferink, Jordan DeKraker, Iva K. Brunec, Stefan Köhler, Morris Moscovitch, and **Dirk B. Walther** (2024). Organization of pRF size along the AP axis of the hippocampus and adjacent medial temporal cortex is related to specialization for scenes versus faces. *Cerebral Cortex*, 34(1), bhad 429. https://doi.org/10.1093/cercor/bhad429
7. Aedan Yue Li, Natalia Ladyka-Wojcik, Heba Qazilbash, Ali Golestani, **Dirk B. Walther**, Chris B Martin, Morgan Barense (2024) Experience transforms crossmodal object representations in the anterior temporal lobes eLife 13:e83382. https://doi.org/10.7554/eLife.83382

8. Gaeun Son, **Dirk B. Walther**, and Michael L. Mack (2024). Brief category learning distorts perceptual space for complex scenes. *Psychonomic Bulletin and* Review. https://doi.org/10.3758/s13423-024-02484-6
9. Morteza Rezanejad, John Wilder, **Dirk B. Walther**, Allan D. Jepson, Sven Dickinson, and Kaleem Siddiqi (2023). Shape-Based Measures Improve Scene Categorization. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 46(4), 2041-2053. https://doi.org/10.1109/TPAMI.2023.3333352
10. Seohee Han, Morteza Rezanejad, and **Dirk B. Walther** (2023). Memorability of line drawings of scenes: the role of contour properties. *Memory and Cognition*, 5. https://doi.org/10.3758/s13421-023-01478-4
11. Delaram Farzanfar and **Dirk B. Walther** (2023). Changing What You Like: Modifying Contour Properties Shifts Aesthetic Valuations of Scenes. *Psychological Science*, 34(10), 1101-1120. https://doi.org/10.1177/09567976231190546
12. Elizabeth Y. Zhou, John Wilder, Claudia Damiano, and **Dirk B. Walther** (2023). Neural dissociation between computational and subjective image complexity. *Psychology of Aesthetics, Creativity, and the Arts*. https://doi.org/10.1037/aca0000605
13. **Dirk B. Walther**, Delaram Farzanfar, Seohee Han, and Morteza Rezanejad (2023). The mid-level vision toolbox for computing structural properties of real-world images. *Frontiers in Computer* Science, 5. https://doi.org/10.3389/fcomp.2023.1140723
14. Yaelan Jung, Tess Allegra Forest, **Dirk B. Walther**, Amy S. Finn (2023). Neither Enhanced Nor Lost: The Unique Role of Attention in Children's Neural Representations. *Journal of Neuroscience*, 43(21), 3849-3859. https://doi.org/10.1523/JNEUROSCI.0159-23.2023
15. Claudia Damiano, Pinaki Gayen, Morteza Rezanejad, Archi Banerjee, Gobinda Banik, Priyadarshi Patnaik, Johan Wagemans, **Dirk B. Walther** (2023) Anger is red, sadness is blue: Emotion depictions in abstract visual art by artists and non-artists. *Journal of Vision* Vol. 23, 1. https://doi.org/10.1167/jov.23.4.1
16. Claudia Damiano, John Wilder, Yue Zhou, **Dirk B. Walther**, and Johan Wagemans (2023) The role of local and global symmetry in pleasure, interest, and complexity judgements of natural scenes. *Psychology of Aesthetics, Creativity, and the Arts*. 17(3), 322–337. https://doi.org/10.1037/aca0000398
17. Greer Gillies, Hyun Park, Jason Woo, **Dirk B Walther**, Jonathan S Cant, Keisuke Fukuda (2023) Tracing the emergence of the memorability benefit. *Cognition* 238, 105489. https://doi.org/10.1016/j.cognition.2023.105489
18. Cameron Kyle-Davidson, Elizabeth Y. Zhou, **Dirk B. Walther**, Adrian G. Bors, Karla K. Evans (2023) Characterising and dissecting human perception of scene complexity. *Cognition* 231, 105319. https://doi.org/10.1016/j.cognition.2022.105319
19. John Wilder, Morteza Rezanejad, Sven Dickinson, Kaleem Siddiqi, Allan Jepson, and **Dirk B. Walther** (2022) Neural correlates of local parallelism during naturalistic vision. *PloS One* 17 (1), e0260266. https://doi.org/10.1371/journal.pone.0260266
20. Morteza Rezanejad, Mohammad Khodadad, Hamidreza Mahyar, Herve Lombaert, Michael Gruninger, **Dirk B. Walther**, Kaleem Siddiqi (2022) Medial spectral coordinates for 3D shape analysis. *IEEE International Conference on Computer Vision and Pattern Recognition*.
21. Gaeun Son, **Dirk B. Walther,** and Michael Mack (2022). Scene wheels: Measuring perception and memory of real-world scenes with a continuous stimulus space. *Behavioral Research Methods* 54 (1), 444-456. https://doi.org/10.3758/s13428-021-01630-5

22. Heping Sheng, John Wilder, and **Dirk B. Walther** (2021) Where to draw the line? *PLoS One* 16 (11), e0258376. https://doi.org/10.1371/journal.pone.0258376
23. Claudia Damiano, **Dirk B. Walther**, and William A. Cunningham (2021) Contour features predict valence and threat judgements in scenes. *Scientific Reports* 11, 19405. https://doi.org/10.1038/s41598-021-99044-y
24. Yaelan Jung and **Dirk B. Walther** (2021) Neural representations in the prefrontal cortex are task dependent for scene attributes but not for scene categories, *Journal of Neuroscience*, 41 (34) 7234-7245. https://doi.org/10.1523/JNEUROSCI.2816-20.2021
25. Annie Cheng, **Dirk B. Walther**, Soojin Park, and Daniel D. Dilks (2021) Concavity as a diagnostic feature of visual scenes. *NeuroImage* 232, 117920. https://doi.org/10.1016/j.neuroimage.2021.117920
26. Morteza Rezanejad, Sidharth Gupta, Chandra Gummaluru, Ryan Marten, John Wilder, Michael Gruninger, **Dirk B Walther** (2021) Contour-guided Image Completion with Perceptual Grouping. Proceedings of the British Machine Vision Conference.
27. Yaelan Jung, **Dirk B. Walther**, and Amy S. Finn (2020). Children automatically abstract categorical regularities during statistical learning. *Developmental Science*. e13072. https://doi.org/10.1111/desc.13072
28. Kevin P. Darby, Sophia W. Deng, **Dirk B. Walther**, and Vladimir M. Sloutsky (2020). The Development of Attention to Objects and Scenes: From Object-Biased to Unbiased. Child Development. https://doi.org/10.1111/cdev.13469
29. Sabrina Perfetto, John Wilder, and **Dirk B. Walther** (2020). Effects of Spatial Frequency Filtering Choices on the Perception of Filtered Images. *Vision* 4(2): 29. https://doi.org/10.3390/vision4020029
30. Morteza Rezanejad, Gabriel Downs, John Wilder, **Dirk B. Walther**, Allan Jepson, Sven Dickinson, and Kaleem Siddiqi (2019) Scene Categorization from Contours: Medial Axis Based Salience Measures. *IEEE International Conference on Computer Vision and Pattern Recognition*.
31. Claudia Damiano, and **Dirk B. Walther** (2019). Distinct roles of eye movements during memory encoding and retrieval. *Cognition*, 184: 119-129. doi: https://doi.org/10.1016/j.cognition.2018.12.014
32. Claudia Damiano, John Wilder, and **Dirk B. Walther** (2019). Mid-level feature contributions to category-specific gaze guidance. *Attention, Perception, & Psychophysics*, 81: 35-46. https://doi.org/10.3758/s13414-018-1594-8
33. John Wilder, Morteza Rezanejad, Sven Dickinson, Kaleem Siddiqi, Allan Jepson, **Dirk B. Walther** (2019). Local contour symmetry facilitates scene categorization. *Cognition*, 182: 307-317. https://doi.org/10.1016/j.cognition.2018.09.014
34. John Wilder, Sven Dickinson, Allan Jepson, and **Dirk B. Walther** (2018). Spatial relationships between contours impact rapid scene classification. *Journal of Vision*. 18(8):1. https://doi.org/10.1167/18.8.1
35. Matthew X. Lowe, Jason Rajsic, Susanne Ferber, and **Dirk B. Walther** (2018). Discriminating scene categories from brain activity within 100 ms. *Cortex* 106. https://doi.org/10.1016/j.cortex.2018.06.006
36. Thomas P. O'Connell, Per B. Sederberg, and **Dirk B. Walther** (2018). Representational differences between line drawings and photographs of natural scenes: A dissociation between multi-voxel

pattern analysis and repetition suppression. *Neuropsychologia*, 117: 513–519. https://doi.org/10.1016/j.neuropsychologia.2018.06.013

37. Yaelan Jung, Bart Larson, and **Dirk B. Walther** (2018). Modality-independent coding of scene categories in prefrontal cortex. *Journal of Neuroscience*. 38(26), 5969–5981. https://doi.org/10.1523/JNEUROSCI.0272-18.2018
38. Yaelan Jung and **Dirk B. Walther** (2018) Using decoding error patterns to trace the neural signature of auditory scene perception, *Proceedings of the 8th International Workshop on Pattern Recognition in NeuroImaging*, Singapore. https://ieeexplore.ieee.org/abstract/document/842395
39. Daniel Berman, Julie D. Golomb, and **Dirk B. Walther** (2017) Scene content is predominantly conveyed by high spatial frequencies in scene-selective visual cortex. *PLOS ONE* 12(12): e0189828. https://doi.org/10.1371/journal.pone.0189828
40. Heeyoung Choo and **Dirk B. Walther** (2017). Modeling the Effect of Stimulus Perturbations on Error Correlations between Brain and Behavior, *Proceedings of the 7th International Workshop on Pattern Recognition in NeuroImaging*, Toronto, Canada
41. Heeyoung Choo, Jack Nasar, Bardia Nikrahei, and **Dirk B. Walther** (2017). Neural codes of seeing architectural styles, *Scientific Reports* 7, 40201, doi:10.1038/srep40201. https://doi.org/10.1038/srep40201
42. Heeyoung Choo and **Dirk B. Walther** (2016) Contour junctions underlie neural representations of scene categories in human visual cortex, *Neuroimage,* 135, 32-44. https://doi.org/10.1016/j.neuroimage.2016.04.021
43. Claudia Damiano and **Dirk B. Walther** (2015) Content, not context, facilitates memory for real-world scenes. *Visual Cognition*, 23(7), 852-855. https://doi.org/10.1080/13506285.2015.1093241
44. Emanuele Olivetti and **Dirk B. Walther** (2015) A Bayesian Test for Comparing Classifier Errors, *Proceedings of the 5th International Workshop on Pattern Recognition in NeuroImaging*: 69-72, Stanford, CA. https://ieeexplore.ieee.org/abstract/document/7270850
45. Thomas O'Connell and **Dirk B. Walther** (2015) Dissociation of salience-driven and content-driven spatial attention to scene category with predictive decoding of gaze patterns, *Journal of Vision*, 12(5):20, 1-13, https://doi.org/10.1167/15.5.20
46. Michael R. Richards, Stephen Rosenstiel, Henry W. Fields, Jr, F. Michael Beck, Allen R. Firestone, **Dirk B. Walther,** and James M. Sackstederg (2015) Contribution of malocclusion and female facial attractiveness to smile esthetics evaluated by eye tracking, *American Journal of Orthodontics and Dentofacial Orthopedics,* 147(4):472-82. https://doi.org/10.1016/j.ajodo.2014.12.016
47. **Dirk B. Walther** and Dandan Shen (2014) Nonaccidental Properties Underlie Human Categorization of Complex Natural Scenes, *Psychological Science*, 25(4): 851-860, https://doi.org/10.1177/0956797613512662
48. Kyungtae Kim, Kai-Hsiang Lin, **Dirk B. Walther**, Mark A. Hasegawa-Johnson, Thomas S. Huang (2014) Automatic Detection of Auditory Salience with Optimized Linear Filters Derived from Human Annotation, *Pattern Recognition Letters*, 38: 78-85. https://doi.org/10.1016/j.patrec.2013.11.010
49. **Dirk B. Walther** (2013) Using confusion matrices to estimate mutual information between two categorical measurements, *Proceedings of the 3rd International Workshop on Pattern Recognition in NeuroImaging*: 220-224. Philadelphia, PA. https://ieeexplore.ieee.org/abstract/document/6603595

50. Ana Torralbo, **Dirk B. Walther**, Barry Chai, Eamon Caddigan, Li Fei-Fei, Diane M. Beck (2013) Good Exemplars of Natural Scene Categories Elicit Clearer Patterns than Bad Exemplars but Not Greater BOLD Activity. *PLoS ONE* 8(3): e58594. https://doi.org/10.1371/journal.pone.0058594

51. Samuel Rivera, Catherine Best, Hyungwook Yim, Aleix Martinez, Vladimir Sloutsky, **Dirk B. Walther** (2012). Automatic selection of eye tracking variables in visual categorization for adults and infants. In N. Miyake, D. Peebles, & R. P. Cooper (Eds.), *Proceedings of the 34th Annual Conference of the Cognitive Science Society*: 2240-2245. Austin, TX: Cognitive Science Society. https://doi.org/10.48550/arXiv.2010.15047

52. **Dirk B. Walther**, Barry Chai, Eamon Caddigan, Diane M. Beck, and Li Fei-Fei (2011), Simple line drawings suffice for functional MRI decoding of natural scene categories, *Proceedings of the National Academy of Sciences of the USA* 108 (23): 9661-9666. https://doi.org/10.1073/pnas.1015666108

53. Loan T.K. Vo, **Dirk B. Walther**, Arthur F. Kramer, Kirk I. Erickson, Walter R. Boot, Michelle W. Voss, Ruchika S. Prakash, Monica Fabiani, Gabriele Gratton, Daniel J. Simons, and Michelle Y. Wang (2011), Predicting Individuals' Learning Success from Patterns of Pre-learning MRI Activity. *PLoS One* 6(1): e16093. https://doi.org/10.1371/journal.pone.0016093

54. **Dirk B. Walther**, Eamon Caddigan, Li Fei-Fei, and Diane M. Beck (2009), Natural scene categories revealed in distributed patterns of activity in the human brain, *Journal of Neuroscience*, 29(34):10573–10581. https://doi.org/10.1523/JNEUROSCI.0559-09.2009

55. Bangpeng Yao, **Dirk B. Walther**, Diane M. Beck, and Li Fei-Fei (2009) Hierarchical Mixture of Classification Experts Uncovers Interactions between Brain Regions, *Neural Information Processing Systems:* 2178-2186. https://proceedings.neurips.cc/paper/2009/hash/a86c450b76fb8c371afead6410d55534-Abstract.html

56. Barry Chai*, **Dirk B. Walther***, Diane M. Beck, and Li Fei-Fei (2009) Exploring Functional Connectivity of the Human Brain using Multivariate Information Analysis, *Neural Information Processing Systems,* 270-278. (* indicates equal contribution) https://proceedings.neurips.cc/paper/2009/hash/8248a99e81e752cb9b41da3fc43fbe7f-Abstract.html

57. Huazhong Ning, Tony X. Han, **Dirk B. Walther**, Ming Liu, and Thomas Huang (2009), Hierarchical Space-Time Model Enabling Efficient Search for Human Actions, *IEEE Transactions on Circuits and Systems for Video Technology*, 19(6): 808-820. https://doi.org/10.1109/TCSVT.2009.2017399

58. **Dirk B. Walther** and Li Fei-Fei (2007) Task-set switching with natural scenes: Measuring the cost of deploying top-down attention. *Journal of Vision*, 7(11):9, 1-12. https://doi.org/10.1167/7.11.9

59. **Dirk Walther** and Christof Koch (2006) Modeling attention to salient proto-objects, *Neural Networks,* 19(9)**:** p. 1395-1407*.* https://doi.org/10.1016/j.neunet.2006.10.001

60. **Dirk Walther***, Ueli Rutishauser*, Christof Koch, and Pietro Perona (2005) Selective visual attention enables learning and recognition of multiple objects in cluttered scenes, *Computer Vision and Image Understanding,* 100: 41-63. (* indicates equal contribution) https://doi.org/10.1016/j.cviu.2004.09.004

61. **Dirk Walther**, Duane R. Edgington, and Christof Koch (2004) Detection and Tracking of Objects in Underwater Video. *IEEE International Conference on Computer Vision and Pattern Recognition,* 1: 544-549. https://ieeexplore.ieee.org/abstract/document/1315079

62. Ueli Rutishauser*, **Dirk Walther***, Christof Koch, and Pietro Perona (2004) Is bottom-up attention useful for object recognition? *IEEE International Conference on Computer Vision and Pattern Recognition,* 2: 37-44. (* indicates equal contribution) https://ieeexplore.ieee.org/abstract/document/1315142

63. **Dirk Walther**, Ueli Rutishauser, Christof Koch, and Pietro Perona (2004), On the usefulness of attention for object recognition, *2nd Workshop on Attention and Performance in Computational Vision at the European Conference for Computer Vision,* 96-103.

64. **Dirk Walther**, Laurent Itti, Maximilian Riesenhuber, Tomaso Poggio, and Christof Koch (2002) Attentional Selection for Object Recognition – a Gentle Way. *Biologically Motivated Computer Vision – Lecture Notes in Computer Science*, Springer 2525: 472-479. https://link.springer.com/chapter/10.1007/3-540-36181-2_47

65. D. Chung, R. Hirata, T. N. Mundhenk, J. Ng, R. J. Peters, E. Pichon, A. Tsui, T. Ventrice, **D. Walther**, P. Williams, and L. Itti (2002) A New Robotics Platform for Neuromorphic Vision: Beobots. *Biologically Motivated Computer Vision – Lecture Notes in Computer Science*, Springer 2525: 558-566. https://link.springer.com/chapter/10.1007/3-540-36181-2_56

## BOOK CHAPTERS

1. Diane Beck and **Dirk B. Walther**, (2024). The natural scene network. In *Oxford Research Encyclopedia of Neuroscience*. https://doi.org/10.1093/acrefore/9780190264086.013.396

2. **Dirk B. Walther** (2021) Architectural styles as subordinate scene categories in *Neuroaesthetics in Focus*. Ed. Eileen Cardillo and Anjan Chatterjee, Oxford University Press.

3. **Dirk B. Walther**, Diane M. Beck, and Li Fei-Fei (2012) To err is human: correlating fMRI decoding and behavioral errors to probe the neural representation of natural scene categories. in: Nikolaus Kriegeskorte and Gabriel Kreiman (eds.), *Visual population codes – Toward a common multivariate framework for cell recording and functional imaging,* MIT Press, Cambridge, Massachusetts, pp. 391-415.

4. **Dirk B. Walther** and Christof Koch (2007) Attention in Hierarchical Models of Object Recognition. in Paul Cisek, Trevor Drew, and John F. Kalaska (eds.), *Computational Neuroscience: Theoretical insights into brain function, Progress in Brain Research,* 165: 57-78.

## POPULAR SCIENCE PUBLICATIONS

5. **Dirk B. Walther**, Claudia Damiano, and Zorana Ivcevic Pringle (2023) Unlocking the Emotional Code of Abstract Art, *Psychology Today*, https://www.psychologytoday.com/us/blog/creativity-the-art-and-science/202305/unlocking-the-emotional-code-of-abstract-art

6. Nachiket Kapre, **Dirk Walther**, Christof Koch, and André DeHon (2004) Saliency on a chip – a digital approach on an FPGA. *The Neuromorphic Engineer* 2: 9-11.

7. **Dirk Walther**, and Duane Edgington (2004) The art of seeing jellies. *The Neuromorphic Engineer* 1: 6-6.

## CONFERENCE PRESENTATIONS (LAST 3 YEARS)

1. Claudia Damiano, Erick G. Chuquichambi, Vasiliki Meletaki, Keaton Bruce, Na Wei, Martin Skov, Anjan Chatterjee, and **Dirk B. Walther** (2025). Curved foreground elements enhance aesthetic appeal of interior spaces. *Toronto Aesthetics Sciences Conference*, Toronto, Ontario, Canada. (oral)
2. Yikai Tang, William A. Cunningham, and **Dirk B. Walther** (2025). Less is more: Aesthetic liking is inversely related to metabolic expense by the visual system. *Toronto Aesthetics Sciences Conference*, Toronto, Ontario, Canada. (oral)
3. Seohee Han and **Dirk B. Walther** (2025). Contours, not textures determine orientation tuning in human visual cortex. *Lake Ontario Visionary Establishment*, Niagara Falls, Ontario, Canada.
4. Athanasios Bourganos and **Dirk B. Walther** (2025). Canonical Field Approximation: A Method for Mapping Perceptually Privileged Viewpoints around Objects. *Lake Ontario Visionary Establishment*, Niagara Falls, Ontario, Canada.
5. Claudia Damiano, Doga Pulat, and **Dirk B. Walther** (2024). Cue combination for visual signals of emotions. *Canadian Society for Brain, Behaviour & Cognitive Science*, Edmonton, Alberta, Canada. (oral)
6. Claudia Damiano, Doga Pulat, and **Dirk B. Walther** (2024). Cue combination for visual signals of emotions. *Visual Science of Arts Conference*, Aberdeen, Scotland. (oral)
7. **Dirk B. Walther** (2024) The role of aesthetics in human visual perception, Annual Summer Interdisciplinary Conference, Molveno, Italy. (oral)
8. Athanasios Bourganos and **Dirk B. Walther** (2024) Canonical perspectives of rendered 3D objects are related to affordance, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida. (oral)
9. Yikai Tang, William Cunningham, and **Dirk B. Walther** (2024) Less is more: Aesthetic liking is inversely related to metabolic expense by the visual system, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida. (oral)
10. Gaeun Son, **Dirk B. Walther**, and Michael Mack (2024) Similarity spaces of real-world scenes in the human brain, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
11. Huiqin Chen, Mei Yang, Gaeun Son, and **Dirk B. Walther** (2024) Crossing category boundaries: Perceptual hysteresis for scenes even with endpoint preview, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
12. Mei Yang, Claudia Damiano, Paul Gauvreau, and **Dirk B. Walther** (2024) Bridging perspectives: a foundational dataset for the empirical aesthetics of bridge design, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
13. Moaz Shoura, **Dirk B. Walther**, and Adrian Nestor (2024) Visualizing the Other-Race Effect with GAN-based Image Reconstruction, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
14. Seohee Han and **Dirk B. Walther** (2024) Mapping contour properties across visual cortex, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
15. Vignash Tharmaratnam, **Dirk B. Walther**, and Jonathan S. Cant (2024) Average Temperature from Visual Scene Ensembles Without Reliance on Color, Contrast or Low Spatial Frequencies, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.

16. Gaeun Son, Michael L. Mack, and **Dirk B. Walther** (2024) Mapping neural similarity spaces for scenes with generative adversarial networks, *Annual Meeting of the Cognitive Neuroscience Society*, Toronto, ON
17. Seohee Han and **Dirk B. Walther** (2024) Mapping contour properties across visual cortex, *Annual Meeting of the Cognitive Neuroscience Society*, Toronto, ON
18. Yuanze Huang, Vignash Tharmaratnam, **Dirk B. Walther**, and Jonathan S. Cant (2024) Average Temperature can be Extracted from Visual Scene Ensembles without Reliance on Contrast, *Annual Meeting of the Cognitive Neuroscience Society*, Toronto, ON
19. Vignash Tharmaratnam, **Dirk B. Walther**, and Jonathan S. Cant (2024) Average Sound Level can be Extracted from Visual Scene Ensembles without Reliance on Visual Contrast, *Annual Meeting of the Cognitive Neuroscience Society*, Toronto, ON
20. Seohee Han, Morteza Rezanejad, and **Dirk B. Walther** (2024) Memorability of line drawings of scenes: the role of contour properties, *Lake Ontario Visionary Establishment*, Niagara Falls, ON
21. Seohee Han, Morteza Rezanejad, and **Dirk B. Walther** (2023) Memorability of line drawings of scenes: the role of contour properties, *Vision: Science to Applications (VISTA) conference*, Toronto, ON
22. Charlotte Leferink, Jordan DeKraker, Iva Brunec, Stefan Köhler, Morris Moscovitch, and **Dirk B Walther** (2023) Receptive field size and scenes versus faces preference in the hippocampus and medial temporal lobe, *29th Annual Meeting of the Organization for Human Brain Mapping*, Montreal, QC. (oral)
23. **Dirk B. Walther**, Delaram Farzanfar, Seohee Han, and Morteza Rezanejad (2023) The Mid-level Vision Toolbox for computing structural properties of real-world images, *32nd Annual Computational Neuroscience Meeting*, Leipzig, Germany.
24. Charlotte Leferink, Jordan DeKraker, Iva Brunec, Stefan Köhler, Morris Moscovitch, and **Dirk B Walther** (2023) Delineation between the neurological underpinnings of perceptual versus cognitive visual processing areas, *Philosophy and Mathematics of Situated Agency*, Oulu, Finland (oral)
25. Seohee Han, Morteza Rezanejad, and **Dirk B. Walther** (2023) Making memorability of scenes better or worse by manipulating their contour properties, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida. (oral)
26. Gaeun Son, Michael L. Mack, and **Dirk B. Walther** (2023) Feature integration in visual search for real-world scenes, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
27. Delaram Farzanfar, Morteza Rezanejad, and **Dirk B. Walther** (2023) Aesthetic value modulates gaze patterns on proto-object locations, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
28. Vignash Tharmaratnam, **Dirk B. Walther**, and Jonathan S. Cant (2023) Ensemble Scene Processing is Regulated by Feature Complexity, *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
29. Vignash Tharmaratnam, **Dirk B. Walther**, and Jonathan S. Cant (2023) Non-Visual Summary Statistics Can be Extracted from Visual Scene Ensembles, 16th Canadian Neuroscience Meeting, Montral, QC.
30. **Dirk B. Walther** (2023) Mid-level vision in complex scenes, *Tagung experimentell arbeitender Psycholog:innen*, Trier, Germany. (oral)

31. Delaram Farzanfar, Gregor Hayn-Leichsenring, Pik ki Ho, Enric Munar, Martin Skov, **Dirk B. Walther**, and Oshin Vartanian (2023) The neural basis of preference for curvature in architecture, *Annual Meeting of the Society for the Neuroscience of Creativity*, San Francisco, CA.
32. Sam Haar, Kikka Okuda, Delaram Farzanfar, and **Dirk B. Walther** (2023) The Relationship Between Aesthetic Judgements and Gaze Behaviour, *Lake Ontario Visionary Establishment*, Niagara Falls, ON.
33. Seohee Han, Morteza Rezanejad, and **Dirk B. Walther** (2023) Making memorability of scenes better or worse by manipulating their contour properties, *Lake Ontario Visionary Establishment*, Niagara Falls, ON.
34. Huiqin Chen, Gaeun Son, and **Dirk B. Walther** (2023) Categorization of continuously changing ambiguous scenes, *Lake Ontario Visionary Establishment*, Niagara Falls, Ontario.
35. Ya Zhao, Vignash Tharmaratnam, **Dirk B. Walther**, and Jonathan S. Cant (2023) Processing average sound level from ensembles of visual scenes, *Lake Ontario Visionary Establishment*, Niagara Falls, ON.
36. Aedan Li, Natalia Ladyka-Wojcik, Heba Qazilbash, Ali Golstani, **Dirk B. Walther,** Chris B. Martin, and Morgan D. Barense (2022) Forming 3-dimensional multimodal object representations relies on integrative coding. *Annual Meeting of the Society for Neuroscience*, San Diego, CA (oral)
37. Moaz Shoura, Adrian Nestor, and **Dirk B. Walther** (2022) Testing the other-race effect with generative adversarial networks. *Annual Meeting of the Society for Neuroscience*, San Diego, CA
38. Delaram Farzanfar and **Dirk B. Walther** (2022) Targeted manipulation of mid-level contour properties causally affects aesthetic liking. *International Association for Empirical Aesthetics,* Philadelphia, PA (oral).
39. **Dirk B. Walther** (2022) Aesthetic pleasure as an epiphenomenon of categorization. *International Association for Empirical Aesthetics,* Philadelphia, PA (oral).
40. Charlotte A. Leferink, Claudia Damiano, and **Dirk B. Walther** (2022) Global and local scene representation across high-level and early visual cortex. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida. (oral)
41. Gaeun Son, **Dirk B. Walther**, and Michael L. Mack (2022) Category learning biases in real-world scene perception. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida. (oral)
42. Aedan Y. Li, Natalia Ladyka-Wojcik, Chris B. Martin, Heba Qazilbash, Ali Golestani, **Dirk B. Walther**, and Morgan D. Barense (2022) Forming 3-Dimensional Multimodal Object Representations Relies on Integrative Coding. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida. (oral)
43. Seohee Han, Morteza Rezanejad, and **Dirk B. Walther** (2022) How do perceptual grouping features affect image memorability? *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
44. **Dirk B. Walther**, Delaram Farzanfar, Gaeun Son (2022) Categorization links Perceptual Fluency and Aesthetic Pleasure. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
45. Huiqin Chen, Gaeun Son, **Dirk B. Walther** (2022) Categorization of continuously changing ambiguous scenes. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
46. Morteza Rezanejad, Kaleem Siddiqi, and **Dirk B. Walther** (2022) Automatic detection of shape parts using maximal inscribed disks. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.

47. Delaram Farzanfar and **Dirk B. Walther** (2022) Scene Contour Junctions Influence Visual Aesthetics. *Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida.
48. Charlotte Leferink, Jordan DeKraker, Iva Brunec, Stefan Kohler, Morris Moscovitch, and **Dirk B. Walther** (2022) Population receptive eld mapping in hippocampus and surrounding medial temporal regions. *Annual Meeting of the Cognitive Neuroscience Society*, San Francisco, California.
49. Claudia Damiano, Pinaki Gayen, Archi Banerjee, Gobinda Banik, Priyadarshi Patnaik, **Dirk B. Walther**, and Johan Wagemans (2021) Emotions are predictable from abstract colour and line drawings made by artists and non-artists, *European Conference on Visual Perception*
50. Claudia Damiano, Pinaki Gayen, Archi Banerjee, Gobinda Banik, Priyadarshi Patnaik, **Dirk B. Walther**, and Johan Wagemans (2021) Anger is red, sadness is blue: Emotion depictions in abstract visual art by artists and non-artists, *International Association for Empirical Aesthetics* (online, oral).
51. **Dirk B. Walther**, Elizabeth Yue Zhou, Claudia Damiano, and John Wilder (2021) Relating brain activity to subjective and pixel-based complexity measures, *International Association for Empirical Aesthetics* (online, oral).
52. **Dirk B. Walther**, Heping Sheng, and John Wilder (2021), Where to draw the line? *Canadian Society for Brain, Behaviour and Cognitive Science* (online, oral).
53. Morteza Rezanejad, Sidharth Gupta, Chandra Gummaluru, Ryan Marten, John Wilder, and **Dirk B. Walther** (2021), Object completion with stochastic completion fields predicts human behavior in recognizing degraded object drawings, *Canadian Society for Brain, Behaviour and Cognitive Science* (online).
54. Gaeun Son, **Dirk B. Walther**, and Michael Mack (2021) Scene wheels: Measuring perception and memory of real-world scenes with a continuous stimulus space, *Virtual Futures Conference, Centre for Vision Research, York University, Toronto, Canada* (online)
55. Morteza Rezanejad, Sidharth Gupta, Chandra Gummaluru, Ryan Marten, John Wilder, and **Dirk B. Walther** (2021) Implementing and integrating contour completion using Perceptual Grouping, *Virtual Futures Conference, Centre for Vision Research, York University, Toronto, Canada* (online)
56. Huiqin Chen, Gaeun Son, and **Dirk B. Walther** (2021) Perceptual hysteresis in the categorization of complex scenes, *Virtual Futures Conference, Centre for Vision Research, York University, Toronto, Canada* (online)
57. Morteza Rezanejad, Sidharth Gupta, Chandra Gummaluru, Ryan Marten, John Wilder, and **Dirk B. Walther** (2021), Object completion with stochastic completion fields predicts human behavior in recognizing degraded object drawings, *Virtual Meeting of the Vision Sciences Society* (online, oral).
58. Yongzhen Xie, John Wilder, Morteza Rezanejad, and **Dirk B. Walther** (2021), Local Symmetry in Human and Artificial Neural Networks, *Virtual Meeting of the Vision Sciences Society* (online).
59. Charlotte Hood and **Dirk B. Walther** (2021), No evidence for gender and cultural differences in eye movements – a meta-analysis, *Virtual Meeting of the Vision Sciences Society* (online).
60. Charlotte A Leferink, Claudia Damiano, and **Dirk B Walther** (2021), Retinotopic organization of high-level visual regions in the human brain, *Virtual Meeting of the Vision Sciences Society* (online).
61. Gaeun Son, **Dirk B. Walther**, and Michael L. Mack (2021), Scene wheels: Measuring perception and memory of real-world scenes with a continuous stimulus space, *Virtual Meeting of the Vision Sciences Society* (online).

62. Greer Gillies, Hyun Park, **Dirk B. Walther**, Jonathan Cant, and Keisuke Fukuda (2021), Tracing the emergence of stimulus memorability, *Virtual Meeting of the Vision Sciences Society* (online).
63. **Dirk B. Walther**, Heping Sheng, and John Wilder (2021), Where to draw the line? *Virtual Meeting of the Vision Sciences Society* (online).
64. Morteza Rezanejad, Sidhart Gupta, Chandra Gummaluru, Ryan Marten, John Wilder, Michael Gruninger, and **Dirk B. Walther** (2021). Object Completion with Stochastic Completion Fields. *Ontario Workshop on Computer Vision 2021* (pp. 10).

## INVITED TALKS

1. "The role of aesthetics in human visual perception," Department of Germanic Languages and Literature, University of Toronto, Toronto, ON, April 2025
2. "The role of symmetry and metabolic cost in visual aesthetics," UCSB Workshop on Human and Computer Vision, Santa Barbara, California, January 2025
3. "The role of aesthetics in human visual perception," Senior Common Room Lunch talk, University College, Toronto, ON, October 2024
4. "Creativity & Design", invited Panel Member, Annual Meeting of the Society for the Neuroscience of Creativity, Toronto, ON, April 2024
5. "Gestalt grouping cues for understanding complex scenes: Evidence from psychophysics, neuroscience, and computer vision", Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany, July 2023
6. "Like what you see? The role of aesthetics in human visual perception", Friedrich-Schiller-Universität Jena, Germany, July 2023
7. "Gestalt grouping cues for understanding complex scenes", Festschrift for Prof. Allan Jepson, Vancouver, BC, June 2023
8. "Like what you see? The role of aesthetics in human visual perception", KU Leuven, Belgium, March 2023
9. "Like what you see? The role of aesthetics in human visual perception", Keynote Lecture at 50$^{th}$ Lake Ontario Visionary Establishment, Niagara Falls, Canada, Feb. 2023
10. "Aesthetics in the visual perception of complex environments", Psychology Engineering Seminar, University of Toronto, Canada, Feb. 2023
11. "Gestalt grouping cues for understanding complex scenes: Evidence from psychophysics, neuroscience, and computer vision.", York University, Toronto, Canada. Jan. 2023
12. "Gestalt grouping cues for understanding complex scenes", invited talk at Shared Visual Representations in Human & Machine Intelligence workshop at NeurIPS, New Orleans, Lousiana, USA, Dec. 2022
13. "Neural correlates of local parallelism in complex, real-world scenes", invited talk at Symposium on Perceptual Organization - Lessons from Neurophysiology, Human Behavior, and Computational Modeling, Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL, May 2022
14. "Gestalt grouping principles in the perception of natural scenes", Technical University Darmstadt, Germany, Jan. 2022 (online)

15. "Machine Learning for Psychological Research", Conference of the Psychology Graduate Students Association, University of Toronto, Jan. 2022 (online)
16. "Aesthetics and perceptual grouping in scene perception", Rotman Research Institute, Baycrest Hospital, Toronto, Ontario, Canada. Dec. 2021 (online)
17. "Cross-modal representations of real-world scenes in the human brain" University of Guelph, Canada, Neuroscience and Applied Cognitive Science Area, October 2021
18. "Cross-modal representations of real-world scenes in the human brain" University of Illinois at Urbana-Champaign, USA, Cognitive Neuroscience Brownbag, October 2021
19. "Aesthetic and affective aspects of scene perception" University of Illinois at Urbana-Champaign, USA, Attention/Perception Brownbag, November 2021
20. "Aesthetic and affective aspects of scene perception" Universität Wien, Austria, July 2021.
21. "Cross-modal representations of real-world scenes in the human brain" 20th EdukCircle International Convention on Psychology, Manila, Philippines, March 2021 (online)
22. "Aesthetic and affective aspects of scene perception" Ebbinghaus Empire Colloquium, Department of Psychology, University of Toronto, Ontario, Canada. January 2021 (online)
23. "Cross-modal representations of real-world scenes in the human brain" Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany, May 2020 (online)
24. "Cross-modal representations of real-world scenes in the human brain" Rotman Research Institute – Research Day, Baycrest Hospital, Toronto, February 2020
25. "Cross-modal representations of real-world scenes in the human brain" University of Toronto at Mississauga Seminar, Mississauga, Ontario, January 2020
26. "Grouping Visual Elements in a Meaningful Way" Psychology Engineering Seminar, University of Toronto, November 2019
27. "Cross-modal, affective and aesthetic aspects of scene perception" Max Planck Institute for Empirical Aesthetics, Frankfurt, Germany, July 2019
28. "Confusion Matrices" – Toronto Neuroimaging Facility Users Meeting Toronto, June 2019
29. "Visual and cross-modal representations of real-world scenes in the human brain." University of Toronto at Scarborough Seminar, Scarborough, Ontario, June 2019
30. "Visual and cross-modal representations of real-world scenes in the human brain." Samsung AI Research Toronto, November 2018
31. "Visual and cross-modal representations of real-world scenes in the human brain." University of Macau, SAR Macau, China. June 2018
32. "Visual and cross-modal representations of real-world scenes in the human brain." Yonsei University, Seoul, South Korea. June 2018
33. "Visual and cross-modal representations of real-world scenes in the human brain." Brain and Mind Institute, Western University, London, Ontario, Canada, April 2018
34. "Perceptual Grouping." Art Gallery of Ontario "First Thursdays" event, Toronto, Ontario, Canada. March 2018

35. “Visual and cross-modal representations of real-world scenes in the human brain.” Rotman Research Institute, Baycrest Hospital, Toronto, Ontario, Canada. October 2017
36. “2D Cues to 3D Structure Underlie Categorization of Real-world Scenes.” Centre de Recherche Cerveau et Cognition, Toulouse, France. June 2016
37. “Contour junctions underlie neural representations of scene categories in high-level human visual cortex.” Freie Universität Berlin, Berlin, Germany. June 2016
38. “Contour junctions underlie neural representations of scene categories in high-level human visual cortex.” Goethe Universität Frankfurt, Frankfurt am Main, Germany. June 2016
39. “2D Cues to 3D Structure Underlie Categorization of Real-world Scenes.” Toronto Western Hospital, Toronto, Ontario, Canada. June 2016
40. “2D Cues to 3D Structure Underlie Categorization of Real-world Scenes.” International Conference on Perceptual Organization, Centre for Vision Research, York University, Toronto, Ontario, Canada. June 2015
41. “Contour junctions are important for neural representations of scenes.” Google Inc., Mountain View, California, USA. June 2015
42. “Contour junctions are important for neural representations of scenes.” Department of Psychology, Stanford University, California, USA. June 2015
43. “Pattern Recognition for fMRI Analysis: Deciphering the Neural Mechanisms of Natural Scene Categorization.” University of Toronto/Tel Aviv University Joint Imaging Conference, Toronto, ON, Canada. May 2015
44. “Which features do people use to categorize natural scenes?” Department of Computer Science, University of Toronto, Ontario, Canada. March 2015
45. “Neural mechanisms of categorizing real-world scenes.” Centre for Vision Research, York University, Toronto, Ontario, Canada. November 2014
46. “Which features do people use to categorize natural scenes?” Ebbinghaus Empire Colloquium, Department of Psychology, University of Toronto, Ontario, Canada. October 2014
47. “Scene categorization is based on structural, not textural features.” Center for Information Technology, Fondazione Bruno Kessler, Trento, Italy. July 2013
48. “The neural representation of natural scene categories.” Department of Psychology, University of Pennsylvania, Philadelphia, Pennsylvania, USA. June 2013
49. “The neural representation of natural scene categories.” Department of Psychology, University of Toronto, Toronto, Ontario, Canada. November 2012
50. “The neural representation of natural scene categories.” Cogfest, Center for Cognitive Science, The Ohio State University, Columbus, Ohio, USA. May 2011
51. “The neural representation of natural scene categories.” Donders Institute for Brain, Cognition and Behaviour, Nijmegen, Netherlands. February 2011
52. “The neural representation of natural scene categories.” Netherlands Institute for Neuroscience, Amsterdam, Netherlands. February 2011
53. “The neural representation of natural scene categories.” Max Planck Institute for Biological Cybernetics, Tübingen, Germany. June 2010

54. "Perceiving real-world visual scenes." Department of Cognitive Science, Johns Hopkins University, Baltimore, Maryland, USA. February 2010
55. "Perceiving real-world visual scenes." Department of Psychology, The Ohio State University, Columbus, Ohio, USA. February 2010
56. "The neural representation of natural scene categories." California Institute of Technology, Pasadena, California, USA. August 2009
57. "The neural representation of natural scene categories." Leibniz Institute for Neurobiology, Otto-von-Guericke-Universität Magdeburg, Germany. June 2009
58. "I Know What You Saw Last Summer: Decoding Brain Activity Associated with Natural Scenes." Beckman Institute Director's Seminar, University of Illinois, Urbana, Illinois, USA. April 2008
59. "The neural representation of natural scene categories." Workshop on "Characterizing and decoding distributed brain representations" at Cosyne, Snowbird, Utah, USA. March 2008
60. "Modeling attention to salient proto-objects." Workshop on "Models and mechanisms of visual attention: a critical appraisal" at NIPS, Whistler, British Columbia, Canada. December 2007
61. "Modeling attention to salient proto-objects." Scene Understanding Symposium at MIT, Cambridge, Massachusetts, USA. February 2007
62. "Modeling Feature Sharing between Object Detection and Top-down Attention." Workshop on "Attention and Performance in Computational Vision" at CVPR San Diego, California, USA. June 2005
63. "Selective Attention for Machine Vision." MIT Perceptual Science Laboratory, Cambridge, Massachusetts, USA. November 2004
64. "Detection of Visual Events in Underwater Video." Monterey Bay Aquarium Research Institute, Moss Landing, California, USA. August 2003
65. "Attentional Selection for Object Recognition – a Gentle Way." Institute of Neuroinformatics, ETH and University of Zurich, Switzerland. November 2002

## SERVICE

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| 2023 | Acting Chair of the Department of Psychology for 16 days |
| 2023 | Member, promotion and tenure committee, Department of Psychology |
| 2023 – 2024 | Member, Working Group on Generative AI and Teaching |
| 2022 | External letter writer for tenure evaluation at Bates College |
| 2022 | Member, teaching evaluation committee for promotion to full professor, Department of Psychology |
| 2021 | Evaluation of scientists at the Rotman Research institute (4 cases) |
| 2021 | Member, four teaching evaluation committees, Department of Psychology |
| 2021 – present | Member, Undergraduate Curriculum Committee, Department of Psychology |
| 2020 – present | Member, IT Committee, Department of Psychology |
| 2020 | Member of two teaching evaluation committees |
| 2020 | Member of committee for Interim Review for Promotion and Tenure |
| 2020 | Member, Search Committee for Chair of the Department of Psychology |

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| 2019 | Search Committee for two Canada Research Chair positions, Rotman Research Institute |
| 2018 – 2019 | Chair, Department Website Committee |
| 2018 | Member, Departmental Progress-Through-the-Ranks (PTR) committee |
| 2018 | Member, Department of Psychology Undergraduate Awards Selection Committee |
| 2018 | Member, University of Toronto Excellence Awards Selection Committee |
| 2016 – 2022 | Chair, Technical Committee of the Toronto NeuroImaging (TONI) facility |
| 2016 – present | Member, Executive Committee of the Toronto NeuroImaging (TONI) facility |
| 2016 – 2019 | Member, committee for redesigning Department of Psychology website |
| 2016 – 2017 | Member, Search Committee for MR Technician |
| 2015 – 2016 | Member, Search Committee for MR Physicist |
| 2015 – 2016 | Member, School of Graduate Studies NSERC CGS-M Committee |
| 2015 – 2017 | Member, Department of Psychology NSERC CGS-M Ranking Committee |
| 2014 – 2016 | Member, MRI Committee, Department of Psychology, University of Toronto |
| 2014 – 2015 | Member, Search Committee for Research Coordinator position |
| 2014 – 2019 | Chair, IT Committee, Department of Psychology, University of Toronto |
| 2012 – 2014 | Member, Committee for the establishment of a graduate minor in Cognitive and Brain Sciences, The Ohio State University |
| 2012 – 2014 | Member, Executive Committee of the Center for Brain and Cognitive Sciences |
| 2012 – 2014 | Member, Management Committee of the Center for Cognitive and Behavioral Brain Imaging, The Ohio State University |
| 2011 – 2014 | Chair, fMRI Technology Committee, Center for Cognitive and Behavioral Brain Imaging, The Ohio State University |

## PROFESSIONAL ACTIVITIES

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| 2023 – present | Associate Editor, *Psychology of Aesthetics, Creativity, and the Arts* (APA Division 10) |
| 2022 – present | Co-editor of Special Research Topic on "Perceptual Organization" in *Frontiers in Computer Science, Psychology, and Neuroscience* |
| 2022 – present | Author and maintainer of freely available MLV Toolbox software (http://mlvtoolbox.org) |
| 2022 | Co-organizer of Symposium on "Perceptual Grouping" at VSS |
| 2021 – present | Associate Editor, ACM Transactions on Applied Perception |
| 2021 | Organizer of VSS Satellite Event "Teaching Vision" |
| 2020 – 2022 | Founder and moderator of Slack channel "Teaching Sensation and Perception" for exchanging ideas and teaching materials among instructors world-wide |
| 2020 | Member of the VSS Elsevier International Travel Awards Committee |
| 2019 – present | Consulting Editor, Attention, Perception and Psychophysics |
| 2017 – 2019 | Chair, Steering Committee for the International Workshop on Pattern Recognition in Neuroimaging |

June 2016 Program Chair, 6th International Workshop on Pattern Recognition in Neuroimaging, Trento, Italy

June 2015 Member of the Program Committee, 5th International Workshop on Pattern Recognition in NeuroImaging, Stanford, California, USA

June 2015 Ad-hoc member of the Cognition and Perception study section at the National Institutes of Health, Annapolis, Maryland, USA

2014 – 2016 Action Editor, Neural Networks

June 2014 Member of the Program Committee, 4th International Workshop on Pattern Recognition in NeuroImaging, Tübingen, Germany

June 2013 Member of the Program Committee, 3rd International Workshop on Pattern Recognition in NeuroImaging, Philadelphia, PA, USA

July 2012 Member of the Program Committee, 2nd International Workshop on Pattern Recognition in NeuroImaging, London, UK

March 2008 Organizer, Workshop on "Characterizing and decoding distributed brain representations" at Computational and Systems Neuroscience, Snowbird, Utah

Dec. 2007 Organizer, Workshop on "Models and mechanisms of visual attention: a critical appraisal" at Neural Information Processing Systems, Whistler, British Columbia

2006 – current Author and maintainer of freely available **SaliencyToolbox** software (http://saliencytoolbox.net)
More than 17,000 downloads since 2006, cited in more than 1,500 papers.

July 2002 Organizer, Workshop on "Saliency-based visual attention" at the Neuromorphic Engineering Summer School, Telluride, Colorado

Ad-hoc Reviewing:

Nature Communications; PNAS; Current Biology; Journal of Neuroscience; Psychological Review; Cerebral Cortex; Neuroimage; Neuropsychologia; Brain Research; Neural Networks; Neural Computation; Journal of Vision; Vision Research; Journal of Experimental Psychology: General; Journal of Experimental Psychology: Human Perception and Performance; Cognition; Attention, Perception & Psychophysics; Frontiers in Perception Science; PLoS One; PLoS Computational Biology; IEEE Transactions on Pattern Analysis and Machine Intelligence; International Journal of Computer Vision; Computer Vision and Image Understanding; Biological Cybernetics; IEEE Transactions on Image Processing; IEEE Transactions on Multimedia; Pattern Recognition; Multimedia Systems Journal; Journal of Information Science and Technology.

## MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Canadian Society for Brain, Behaviour and Cognitive Science (CSBBCS)
Society for Neuroscience (SfN)
Vision Sciences Society (VSS)
Association for Psychological Science (APS)
American Psychological Association (APA)
Division 3 (Society for Experimental Psychology and Cognitive Science)
Division 10 (Society for the Psychology of Aesthetics, Creativity and the Arts)
International Association of Empirical Aesthetics (IAEA)
Deutscher Hochschulverband (DHV)

Senior Member, Institute for Electrical and Electronics Engineers (IEEE)
IEEE Computer Society

## MENTORING

**Masters Students:**

2011 – 2012 Dandan Shen: Categorization of Line Drawings of Natural Scenes Using Non-Accidental Properties Matches Human Behavior

2012 – 2014 Daniel Berman: From Photons to Photos: Mapping Functional and Organizational Properties of Human Visual Cortex with fMRI

2014 – 2015 Claudia Damiano: Eye movements as a predictor of the perception and memory of scenes

2019 – 2020 Ben Hyun Park: Visual Working Memory Resetting

**Doctoral Students:**

2014 – 2019 Yaelan Jung: Neural codes of cross-modal representations of abstract concepts

2015 – 2019 Claudia Damiano: Attentional and emotional contributions to viewing natural scenes

2017 – 2023 Charlotte Leferink: Modeling perception of photographs and line drawings of real-world scenes with deep convolutional neural networks

2021 – 2023 Delaram Farzanfar: Aesthetics of Scene Perception

2019 – 2024 Gaeun Son: Characterizing visual information stored in short-term memory

2021 – present Seohee Han: Mid-level feature contributions to scene perception and memorability

2023 – present Athanasios Bourganos: Preferred viewing angles for 3D objects

**Postdoctoral Fellows:**

2012 – 2014 Heeyoung Choo: The role of contour properties in scene perception

2015 – 2021 John Wilder: The effect of symmetry on scene perception (co-supervised with Sven Dickinson, Computer Science, University of Toronto)

2020 – 2022 Morteza Rezanejad: Shape Based Measures Improve Scene Categorization

2023 – present Claudia Damiano: The curvature effect in empirical aesthetics