

# DAVID PAUL MELCHER

Associate Professor  
University of Trento  
Corso Bettini 31, Rovereto Italy

email: david.melcher@unitn.it  
Phone: +39 0464 808665  
DOB: 10 December, 1971

Active Perception Group: <http://r.unitn.it/en/cimec/map>

---

## ACADEMIC QUALIFICATIONS

2001 PhD in Psychology, Rutgers University (New Jersey, USA)  
1998 MSc in Psychology, Rutgers University  
1994 BA (Magna Cum Laude), Transylvania University (Kentucky, USA)

## EXPERIENCE

12/2006-present Associate Professor, Faculty of Cognitive Sciences, University of Trento

06/2015-09/2015 Visiting researcher, Harvard and NYU Medical Schools

07/2013-07/2014 Visiting professor, Harvard Summer School  
-Course on "Art, Mind and Brain" (Summer 2013 and 2014)

2011-2012 Visiting professor, Bocconi University (Milan, Italy)  
-Course on "Neuroscience of everyday life"

2010-2012 Visiting professor, San Raffaele University (Milan, Italy)  
-Courses on "Cognition" and "Neuroscience of vision"

09/2003-12/2006 Principal Lecturer, Oxford Brookes University  
-Leader of the Masters in Cognitive Neuropsychology (2004-2006)  
-Quality Assessment Officer (2003-2006)

03/2006-07/2006 Visiting Fellow, College de France

02/2005-09/2006 Research Fellow, Oxford University

06/2001-08/2003 Research Fellow, San Raffaele University (Milan, Italy)

## **AWARDS AND HONORS**

### **Autonomous Province of Trento “Grandi Progetti” Grant (2013-2017)**

Principal Investigator

Budget ~ 2.2 Million USD

Title: Characterizing and improving brain mechanisms of attention

### **European Research Council Starting Grant (2013-2017)**

Principal Investigator

Budget ~ 1.1 Million USD

Title: Construction of perceptual space-time

### **American Psychological Association (2011)**

Distinguished Scientific Award for Early Career Contribution to Psychology

<http://www.ncbi.nlm.nih.gov/pubmed/22082390>

### **PRIN 2009, Ministero dell’Università e della Ricerca (2011-2013)**

Co-investigator

Budget ~ 150,000 USD

Title: Perceiving spatiotemporal events across saccades

### **CARITRO Foundation (2011-2012)**

Principal Investigator

Budget ~ 30,000 USD

Title: Capolavori della mente”, in collaboration with the MART museum

### **PRIN 2007, Ministero dell’Università e della Ricerca (2008-2010)**

Co-investigator

Budget ~ 90,000 USD

Title: Cambiamenti predittivi delle caratteristiche percepite degli stimoli visivi prima delle saccadi

### **British Academy (2005-2008)**

Principal Investigator

Budget ~ 10,000 USD

Title: Mechanisms and locus of implicit attentional selection

### **The Wellcome Trust (2007)**

Co-investigator

Budget ~ 8,000 USD

Title: Art and the Senses

### **RNID Research grant (2004-2006)**

Co-investigator

Budget ~ 150,000 USD

Title: Using deaf children’s visual skills to promote mathematics learning: An early intervention project

**Royal Society (2004-2005)**

Principal Investigator

Title: Behavioural effects of suppressed and unattended information

**British Academy (2004-2005)**

Principal Investigator

Title: The duration of visual attributes of natural scenes

**National Institutes of Health**

F32 Research Fellowship (2003)

NRSA Fellowship (1999-2001)

**National Merit Scholar (1990)****SERVICE (Selected)**

Editorial Board, *Journal of Vision* (2013 –present; position renewed in 2018)

Editorial Board, *Perception* (2016 – present)

Editorial Board, *i-Perception* (2016 – present)

Guest Editor, *PLoS Computational Biology* (2019)

Guest Editor, *Philosophical Transactions of the Royal Society B: Biological Sciences* (2011)

Head of the *Doctoral School in Cognitive and Brain Sciences* (2010 – 2013)

Coordinator, *Masters in Cognitive Science Program* (2009 - 2014)

Coordinator of the Cognitive Neuroscience program in the India-Trento Program for Advanced Research (ITPAR) (2008 – 2017)

Delegate for the University of Trento committees on Internationalization (2014), Equality and Diversity (2015-present), manager of University outreach for North America (2015-present) and coordinator of Erasmus Mundus project “AREAS” (2011-2014)

Co-organizer of the *Rovereto Attention Workshops*, October 2009, 2011, 2013, 2015.

Member of the Scientific Advisory Board for the Helmholtz Institute (2018-present)

External expert member on assistant professor position hiring committee for San Raffaele University (2016)

Dissertation examination committee member for Umea University (2007), San Raffaele University (2010), INSERM-Paris (2017), University of Sydney (2018)

Co-organizer of the Renaissance Vision workshop (ECVP, Arezzo, Italy, 2007).

Co-organizer of the symposium “Making Sense of Art, Making Art of Sense”, Oxford University, 27-29 October, 2006.

Member of the scientific committee of the European Conference on Visual Perception (2004, 2005, 2007, 2012, 2014-2017).

Member of the Program Committee, 6<sup>th</sup> International workshop on Attention in Cognitive Systems (ISACS 2013), in conjunction with IJCAI 2013.

Member of the Program Committee for CEA 2013 (International Conference on Cognition, Emotion and Action), IIT Gandhinagar, India.

Grant reviewer for the European Research Council (2015, 2018), National Science Foundation USA (2017), ATIP-Avenir Grant Program France (2018), Research Foundation Flanders (2014, 2015), MIUR (2012-2014), Agence Nationale de la Recherche (2012), Trieste University (2012), Israel Science Foundation (2011), National Science Foundation NSF (2008, 2009), BBSRC (2009, 2010), Netherlands Organization for Scientific Research (2009), Royal Society of New Zealand (2005, 2006), RNID (2004) and the National Institute of Mental Health (2002).

Ad-hoc reviewer of articles for: *Autism Research, Cerebral Cortex, Cognition, Cortex, Current Biology, eLife, Experimental Brain Research, Frontiers in Psychology, J. Experimental Psychology: Human Perception and Performance, J. Experimental Psychology: Learning, Memory & Perception, J. Neuroscience, J. Vision, Memory and Cognition, Perception, Perception & Psychophysics, PloS One, PNAS, Psychological Science, Psychonomic Bulletin & Review, Spatial Vision, Vision Research, Visual Cognition.*

## **SUPERVISION OF RESEARCHERS AND THESES**

Department of Psychology and Cognitive Sciences and Center for Mind Brain Sciences, University of Trento: 12 postdoctoral fellows, 5 PhD students, 28 students (Bachelors, Masters degree theses).

## PUBLICATIONS

Notaro G, van Zoest W, Altman M, **Melcher D**, Hasson U (2019). Predictions as a window into learning: anticipatory fixation offsets carry more information about environmental statistics than reactive stimulus-responses. *Journal of Vision*, 19, 8.

Sharp P, **Melcher D**, Hickey C (2019) Different effects of spatial and temporal attention on the integration and segregation of stimuli in time. *Attention, Perception & Psychophysics*, 81, 433-441.

Huber-Huber C, Buonocore A, Hickey C, **Melcher D** (2018). Previewing a face in the periphery reduces the fN170: Combined EEG and eye-tracking suggests two stages of trans-saccadic predictive processes. *bioRxiv*, 468900, doi: <https://doi.org/10.1101/468900>.

Wutz A, **Melcher D**, Samaha J (2018) Frequency modulation of neural oscillations according to visual task demands. *Proceedings of the National Academy of Sciences*, 115 (6) 1346-1351.

Ronconi L, Busch N, **Melcher D** (2018) Alpha-band sensory entrainment alters the duration of temporal windows in visual perception. *Scientific Reports*, 8, 11810.

Drewes J, Zhu W, **Melcher D**. (2018) The edge of awareness: Mask spatial density, but not color, determines optimal temporal frequency for continuous flash suppression. *Journal of Vision*, 18(1):12. doi: 10.1167/18.1.12.

Sharp P, **Melcher D**, Hickey C (2018). Endogenous attention modulates the temporal window of integration. *Attention, Perception & Psychophysics*, 80(5), 1214-1228, doi: 10.3758/s13414-018-1506-y.

Ronconi L, Oosterhof N, Bonmassar C & **Melcher D** (2017) Multiple oscillatory rhythms determine the temporal organization of perception. *Proceedings of the National Academy of Sciences*, 114(51):13435-13440.

Ronconi L & **Melcher D** (2017) The role of oscillatory phase in determining the temporal organization of perception: evidence from sensory entrainment. *The Journal of Neuroscience*, 37 (44) 10636-10644.

Buonocore A, Fracasso A & **Melcher D** (2017) Pre-saccadic perception: separate time courses for enhancement and spatial pooling at the saccade target. *PLoS One*, 12(6):e0178902.

Fairhall SL, Schwarzbach J, Lingnau A, Van Koningsbruggen M & **Melcher D**. (2017). Spatiotopic updating across saccades revealed by spatially-specific fMRI adaptation. *Neuroimage*, 147:339-345.

- Saunders D, **Melcher D** & van Zoest, W (2017). No evidence of task co-representation in a joint Stroop task. *Psychological Research*  
<https://doi.org/10.1007/s00426-017-0909-z>
- Sengupta R, Bapiraju S & **Melcher D** (2017). Big and small numbers: Empirical support for a single, flexible mechanism for numerosity perception. *Attention, Perception & Psychophysics*, 79(1):253-266.
- Wutz A, Muschter E, van Koningsbruggen MG, Weisz N & **Melcher D** (2016) Temporal integration windows in neural processing and perception aligned to saccadic eye movements. *Current Biology*, 26, 1-10.
- Buonocore A, McIntosh RD & **Melcher D** (2016) Beyond the point of no return: effects of visual distractors on saccade amplitude and velocity. *Journal of Neurophysiology*, 115(2):752-62.
- Corbett JE, Venuti P & **Melcher D** (2016) Perceptual Averaging in Individuals with Autism Spectrum Disorder, *Frontiers in Psychology* 7:1735. doi: 10.3389/fpsyg.2016.01735.
- De Pisapia N, Bacci F, Parrott D & **Melcher D** (2016). Brain networks for visual creativity: a functional connectivity study of planning a visual artwork. *Scientific Reports*. 6:39185. DOI: 10.1038/srep39185.
- Gilani SO, Subramanian R, Yan Y, **Melcher D**, Sebe N & Winkler S (2016) PET: An eye-tracking dataset for animal-centric Pascal object classes. *Proceedings of the 2015 IEEE International Conference on Multimedia and Expo (ICME)*, 1-6. doi: 10.1109/ICME.2015.7177450
- Zhu W, Drewes J, Peatfield N & **Melcher D** (2016). Differential visual processing of animal images, with and without conscious awareness, September 2016, *Frontiers in Human Neuroscience* 10:513
- Wutz A, Drewes J & **Melcher D**. (2016). Nonretinotopic perception of orientation: Temporal integration of basic features operates in object-based coordinates. *Journal of Vision*, 16(10):3. doi: 10.1167/16.10.3.
- Zhu W, Drewes J & **Melcher D** (2016). Time for Awareness: The Influence of Temporal Properties of the Mask on Continuous Flash Suppression Effectiveness, *Plos One* 11(7):e0159206.
- Fracasso A & **Melcher D** (2016). Saccades Influence the Visibility of Targets in Rapid Stimulus Sequences: The Roles of Mislocalization, Retinal Distance and Remapping, *Frontiers in Systems Neuroscience*.
- Buonocore A & **Melcher D** (2015) Interference during eye movement preparation shifts the timing of peri-saccadic compression. *Journal of Vision*, 15(15):3.

Buonocore A & **Melcher D** (2015). Disrupting saccadic updating: visual interference prior to the first saccade elicits spatial errors in the secondary saccade in a double-step task. *Experimental Brain Research*, 233(6):1893-1905.

Drewes J, Zhu W, Wutz A & **Melcher D** (2015). Dense sampling reveals behavioral oscillations in rapid visual categorization. *Scientific Reports*, 5:16290.

Fracasso A, Kaunitz L & **Melcher D** (2015). Saccade kinematics modulate perisaccadic perception. *Journal of Vision*, 15(3). pii: 4.

Hartzell JF, Davis B, **Melcher D** et al. (2015). Brains of verbal memory specialists show anatomical differences in language, memory and visual systems. *Neuroimage*, Jul 15. pii: S1053-8119(15)00638-2

**Melcher D** & Morrone MC (2015). Non-retinotopic visual processing in the brain. *Visual Neuroscience*, 32, E017.

Wutz A, Shukla A, Bapi RS & **Melcher, D.** (2015) Expansion and Compression of Time Correlate with Information Processing in an Enumeration Task. *PLoS One*, 10(8):e0135794.

Van Paaschen J, Bacci F & **Melcher, D** (2015). The Influence of Art Expertise and Training on Emotion and Preference Ratings for Representational and Abstract Artworks. *PLoS One*, 10(8): e0134241.

Cavicchio F, **Melcher D** & Poesio M (2014). The effect of linguistic and visual salience in visual world studies. *Frontiers in Psychology*, 5:176.

Corbett, JE & **Melcher D** (2014). Stable statistical representations facilitate visual search. *Journal of Experimental Psychology: Human Perception Performance*, 40(5), 1915-25.

Corbett, JE & **Melcher D.** (2014). Characterizing ensemble statistics: Mean size is represented across multiple frames of reference. *Attention, Perception, & Psychophysics*, 76(3), 746-58.

Drewes J, Zhu W & **Melcher D** (2014) Dissociation Between Spatial and Temporal Integration Mechanisms in Vernier Fusion. *Vision Research*, 105, 21-28.

Fairhall SL, Albi A & **Melcher D** (2014). Temporal Integration Windows for Naturalistic Visual Sequences. *PLOS One*. 9(7):e102248.

Kaunitz L., Fracasso A., Skujevskis M. & **Melcher D.** (2014). Waves of visibility: probing the depth of inter-ocular suppression with transient and sustained targets. *Frontiers in Psychology*, 5:804.

Knops A, Piazza M, Sengupta R, Eger E & **Melcher D** (2014). A shared, flexible neural map architecture reflects capacity limits in both visual short term memory and enumeration. *Journal of Neuroscience*, 34(30), 9857-9866.

Lanzoni L, **Melcher D**, Miceli G, Corbett JE (2014). Global statistical regularities modulate the speed of visual search in patients with focal attentional deficits. *Frontiers in Psychology*, 5:514.

Sengupta R, Surampudi BR, & **Melcher D** (2014). A visual sense of number emerges from the dynamics of a recurrent on-center off-surround neural network. *Brain Research*, 1582:114-24.

Subramanian R, Shankar D, Sebe N & **Melcher D** (2014) Emotion modulates eye movement patterns and subsequent memory for the gist and details of movie scenes. *Journal of Vision*, 14(3):31.

Wutz A, Weisz N, Braun C & **Melcher D** (2014). Temporal windows in visual processing: 'Pre-stimulus brain state' and 'post-stimulus phase reset' segregate visual transients on different temporal scales. *Journal of Neuroscience*, 34(4), 1554-65.

Wutz A & **Melcher D** (2014). The temporal window of individuation limits visual capacity. *Frontiers in Psychology: Perception Science*, 5:952.

Fracasso A, Targher S, Zampini M & **Melcher D** (2013) Fooling the eyes: the influence of a sound-induced visual motion illusion on eye movements. *PLoS One*. 26;8(4):e62131.

Kaunitz L, Fracasso A, Lingnau A & **Melcher D** (2013) Non-conscious processing of motion coherence can boost conscious access. *PLoS One*. 8(4):e60787.

**Melcher D** & Bacci F (2013) Perception of emotion in abstract artworks: a multidisciplinary approach. *Progress in Brain Research*, 204:191-216.

Wutz A & **Melcher D** (2013) Temporal buffering and visual capacity: the time course of object formation underlies capacity limits in visual cognition. *Attention, Perception & Psychophysics*, 75(5): 921-933.

Dempere-Marco L, **Melcher D** & Deco G (2012) Effective visual working memory capacity : an emergent effect from the neural dynamics in an attractor network. *PLoS One*, 7(8) :e42719

**Melcher D** & Fracasso A (2012) Remapping of the line motion illusion across eye movements. *Experimental Brain Research*, 218(4) : 503-14.



Wutz A, Caramazza A & **Melcher D** (2012) Rapid enumeration within a fraction of a single glance : the role of visible persistence in object individuation capacity. *Visual Cognition*, 20(6) : 717-32.

Yanulevskaya V, Uijlings J, Bruni E, Sartori A, Zamboni E, Bacci F, **Melcher D** & Sebe N (2012). In the eye of the beholder: employing statistical analysis and eye tracking for analyzing abstract paintings. *Proceedings of the 20th ACM international conference on Multimedia MM12*, 349-358

Kaunitz LN, Fracasso A & **Melcher D** (2011) Unseen complex motion is modulated by attention and generates a visual aftereffect. *Journal of Vision*, 11(13), 10.

Kaunitz LN, Kamienkowski JE, Olivetti E, Murphy B, Avesani P & **Melcher D**. (2011) Intercepting the first pass: rapid categorization is suppressed for unseen stimuli. *Frontiers in Psychology*, 2:198.

**Melcher D** (2011) Visual stability. *Philosophical Transactions of the Royal Society B.*, 366, 468-475.

**Melcher D** & Murphy B (2011) The role of semantic interference in limiting memory for the details of visual scenes. *Frontiers in Psychology*. DOI :10.3389/fpsyg.2011.00262.

**Melcher D** & Piazza M (2011) The role of attentional priority and saliency in determining capacity limits in enumeration and visual working memory. *PLoS One*, 6(12) : e29296

Piazza M, Fumarola A, Chinello A, **Melcher D** (2011) Subitizing reflects visuo-spatial object individuation capacity. *Cognition*, 121(1):147-53.

De Pisapia N, Kaunitz L & **Melcher D** (2010) Backward masking and unmasking across saccadic eye movements. *Current Biology*, 20, 613-7.

Fracasso A, Caramazza A & **Melcher D** (2010) Continuous perception of motion and shape across saccadic eye movements. *Journal of Vision*, 10(13):14.

**Melcher D**. (2010) Accumulating and remembering the details of neutral and emotional scenes. *Perception*, 39(8), 1011-1025.

**Melcher D**. (2010) The missing link for attentional pointers: comment on Cavanagh et al. *Trends in Cognitive Sciences*, 14(11), 473.

**Melcher D**. (2009) Selective attention and the active remapping of object features in trans-saccadic perception. *Vision Research*, 49, 1249-55.

**Melcher D**, Colby CL (2008) Trans-saccadic perception. *Trends in Cognitive Sciences*, 12, 466-73.

**Melcher D.** (2008) Dynamic object-based remapping of visual features in trans-saccadic perception. *Journal of Vision* (special issue on Visual Stability), 8, 1-17.

**Melcher D**, Bacci F (2008) The visual system as a constraint on the survival and success of specific artworks. *Spatial Vision*, 21, 347-62.

Alais D, **Melcher D.** (2007) Strength and coherence of binocular rivalry depends on shared stimulus complexity. *Vision Research*, 47, 269-79.

Tatler B, **Melcher D.** (2007) Pictures in mind: Initial encoding of object properties varies with the realism of the scene stimulus. *Perception*, 36, 1715-29.

**Melcher D.** (2007) Predictive re-mapping of visual features precedes saccadic eye movements. *Nature Neuroscience*, 10, 903-7.

**Melcher D.** (2006) Accumulation and persistence of memory for natural scenes, *Journal of Vision*, 6, 8-17.

**Melcher D**, Vidnyanszky Z. (2006) Subthreshold features of visual objects: Unseen but not unbound, *Vision Research*, 46, 1863-1867.

**Melcher D**, Wade N. (2006) Cave art interpretation II. *Perception*, 35, 719-22.

Wade N, **Melcher D.** (2006) Cave art interpretation I. *Perception*, 35, 577-80.

**Melcher D.** (2005) Spatiotopic transfer of visual form adaptation across saccadic eye movements. *Current Biology*, 15, 1745-1748.

**Melcher D.** (2005) When the brain doesn't see eye to eye. *Trends in Cognitive Science*, 9, 216-217.

**Melcher D.**, Pappas TV, Vidnyanszky Z. (2005) Implicit attentional selection of bound visual features. *Neuron*, 46, 723-729.

**Melcher D**, Crespi S, Bruno A, Morrone MC (2004) The role of attention in central and peripheral motion integration. *Vision Research*, 44, 1367-74.

**Melcher D**, Bacci F (2003) A moment's monument: The central vision of Italian sculptor Medardo Rosso (1858-1928). *Perception*, 32, 1051-8.

**Melcher D**, Morrone MC (2003) Spatiotopic temporal integration of visual motion across saccadic eye movements. *Nature Neuroscience*, 6, 877-881.

**Melcher D** (2001) Persistence of visual memory for scenes. *Nature*, 412, 401.

**Melcher D**, Kowler E (2001) Visual scene memory and the guidance of saccadic eye movements. *Vision Research*, 41, 3597-3611.

**Melcher D**, Kowler E (1999) Shape, surfaces and saccades. *Vision Research*, 39, 2929-46.

### Books & Book Chapters

Bacci F, **Melcher D**, Editors (2011) *Art and the Senses*, Oxford University Press. ISBN13: 9780199230600; ISBN10: 0199230609

Bacci F, **Melcher D**. (2018) Di un realismo ulteriore: strategie pittoriche e percettive nell'opera di Renato Guttuso. In Carapezza M (Ed.) *(Ri)leggere Guttuso: Percezione, realism, impegno civile*, Palermo University Press.

**Melcher D** (2014) Mental landscapes: the cognitive neuroscience of scene perception. *In resonance: snapshots of creativity in the brain* (Exhibition catalog). Museo di Arte Moderna e Contemporanea di Trento e Rovereto.

**Melcher D** & Cavanagh P (2011) Pictorial cues in art and in visual perception. In F. Bacci & D. Melcher (Eds.) *Art and the Senses*, Oxford University Press.

**Melcher D** & Zampini M (2011) Audio-visual integration in science and the arts. In F. Bacci & D. Melcher (Eds.) *Art and the Senses*, Oxford University Press.

Muniz V & **Melcher D** (2011) The mystery of representation: A conversation with Vik Muniz. In F. Bacci & D. Melcher (Eds.) *Art and the Senses*, Oxford University Press.

**Melcher D** & Morrone MC (2007) Trans-saccadic memory: building a stable world from glance to glance. In R. Van Gompel et al. (Eds.), *Eye movement research: A window on mind and brain* (Amsterdam: Elsevier).

## INVITED TALKS AND PUBLIC DISSEMINATION (SELECTED)

Invited talks at universities and research centers including York University, University of Montreal and Queens University (Canada), Tsinghua, Beijing Normal, Hong Kong and Kunming Universities (China), European Institute for Theoretical Neuroscience, College de France, INSERM Cognitive Neuroimaging Unit Paris and Renee Descartes University Paris (France), Ernst Strüngmann Institute Frankfurt, Humboldt University Berlin, Justus-Liebig-University Giessen, Ludwig-Maximilians University Munich, Muenster and Regensburg Universities (Germany), PPKE and Semmelweis Universities (Hungary), Banaras and Hyderabad Universities (India), Bocconi, Parma, Pisa, San Raffaele and Trieste Universities (Italy), Riken Brain Institute and Tokyo Institute of Technology (Japan), Donders Institute for Brain, Cognition and Behaviour//Radboud University and Utrecht University (Netherlands), Oslo University (Norway), Umea University (Sweden), NYU Abu Dhabi (UAE), Bristol, Dundee, Glasgow, Kingston University London, Oxford, Royal Holloway and University College London (United Kingdom), Brown, Harvard, Rutgers, University of South Florida, U.S. Naval Research Laboratory, University of Florida and University of Massachusetts-Boston (United States), and Hanoi University of Technology (Vietnam).

Invited speaker at the meeting on the “Trentino system of higher education and research” at the European Parliament (2012), the *Festival della Scienza* (Genova, 2014) and the “Wired Next Fest” (Milan, 2016).

Interviewed for National Public Radio program “Morning Edition” (US), *New Scientist* magazine, *Airone* magazine, *Internazionale* magazine, Italian Radio 24, Italian television channels RAI2 (national news story) and RAI3 (*Ballarò, E se domani* science show), the documentary *The Sense of Beauty* (RAI5, episodes 1, 3 and 4), and for numerous stories in newspapers including *Il Messaggero*, *Il Corriere della Sera*, *La Repubblica*, *La Stampa*, *L'Adige* and *Il Trentino*.