

Publications

Journal articles currently under review

Lee, R.J., Mather, G. Chromatic adaptation from achromatic stimuli with implied colour. Under review at *Attention, Perception, & Psychophysics*.

Pavan, A., Ghin, F., Contillo, A., Milesi, C., Campana, G., Mather, G. Modulatory mechanisms underlying high-frequency transcranial random noise stimulation (hf-tRNS): a combined stochastic resonance and equivalent noise approach. Under review at *Brain Stimulation*.

Journal articles previously published

Ghin, P., Pavan, A., Contillo, A., Mather, G. (2018) The effects of high-frequency transcranial random noise stimulation (hf-tRNS) on global motion processing: an equivalent noise approach. *Brain stimulation*, 11(6), 1263-1275.
<https://doi.org/10.1016/j.brs.2018.07.048>.

Mather, G., Parsons, T. (2018) Adaptation reveals sensory and decision components in the visual estimation of locomotion speed. *Scientific Reports*, 8(1), 13059.
<https://doi.org/10.1038/s41598-018-30230-1>.

Mather, G. (2018) Visual image statistics in the history of Western art. *Art and Perception*, 8.
<https://doi.org/10.1163/22134913-20181092>.

Mather, G., Sharman, R.J., Parsons, T. (2017) Visual adaptation alters the apparent speed of real-world actions. *Scientific Reports*, 7, 6738.

Pavan, A., Gall, M.G., Bimson, L.M., Ghin, F., Mather, G. (2017) The interaction between orientation and motion signals in moving oriented Glass patterns. *Visual Neuroscience*, 34, E010.

Pavan, A., Ghin, F., Donato, R., Campana, G., Mather, G. (2017) The neural basis of form and form-motion integration from static and dynamic translational Glass patterns: A rTMS investigation. *NeuroImage*, 157, 555-560.

Mather, G., & Lee, R. (2017) Turbine Blade Illusion. *i-Perception*, 8 (3), 1-5.

Mather, G., Battaglini, L., & Campana, G. (2016) TMS reveals flexible use of form and motion cues in biological motion perception. *Neuropsychologia*, 83, 193-197.

Mather, G., Sharman, R.J. (2015) Decision-level adaptation in motion perception. *Royal Society Open Science*, 2 (12), 150418.

Mather, G. (2014) Artistic adjustment of image spectral slope. *Art & Perception*, 2 (1-2), 11-22.

- Pavan, A., Contillo, A., Mather, G. (2014) Modelling fast forms of visual neural plasticity using a modified second-order motion energy model. *Journal of Computational Neuroscience*, 37, 493-504.
- Pavan, A., Marotti, R. B., & Mather, G. (2013). Motion-form interactions beyond the motion integration level: Evidence for interactions between orientation and optic flow signals. *Journal of Vision*, 13(6).
- Mather, G., Pavan, A., Bellocosa Marotti, R., Campana, G., & Casco, C. (2013) Interactions between motion and form processing in the human visual system. *Frontiers in Computational Neuroscience*, 7, 65.
- Pavan, A., Contillo, A., & Mather, G. (2013). Modelling adaptation to directional motion using the Adelson-Bergen energy sensor. *PLoS One*, 8(3), e59298.
- Mather, G., Pavan, A., Bellacosa, R., Casco, C. (2012) Psychophysical evidence for interactions between visual motion and form processing at the level of motion integrating receptive fields. *Neuropsychologia*, 50(1), 153-159.
- Mather, G. (2012) Aesthetic judgement of orientation in modern art. *i-Perception*, 3, 18-24.
- Pavan, A., Casco, C., Mather, G., Bellacosa, R., Cuturi, L.F., Campana, G. (2011) The effect of spatial orientation on detecting motion trajectories in noise. *Vision Research*, 51, 2077-2084.
- Challinor, K.L., Mather, G. (2010) A motion-energy model predicts the direction discrimination and MAE duration of two-stroke apparent motion at high and low retinal illuminance. *Vision Research*, 50, 1109-1116.
- Mather, G. (2010). Head – body ratio as a visual cue for stature in people and sculptural art. *Perception*, 39(10), 1390-1395.
- Mather, G. Challinor, K. L. (2009). Psychophysical properties of two-stroke apparent motion. *Journal of Vision*, 9(1):28, 1-6.
- Mather, G., Pavan, A. (2009) Motion-induced position shifts occur after motion integration. *Vision Research*, 49, 2741-2746.
- Mather G (2008) Perceptual uncertainty and line-call challenges in professional tennis. *Proceedings of the Royal Society Series B*, 275, 1645-1651.
- Pavan A, Mather G (2008) Distinct position assignment mechanisms revealed by cross-order motion. *Vision Research*, 48, 2260-2268.
- Mather G, Pavan A, Campana G, Casco C (2008) The motion after-effect reloaded. *Trends in Cognitive Sciences*, 12, 481-487.

Mather G (2006) Two-stroke: a new illusion of visual motion based on the time course of neural responses in the human visual system. *Vision Research*, 46, 2015-2018.

Mather G, Daniell AK (2005) No effect of spatial phase randomisation on direction discrimination in dense random element patterns. *Vision Research*, 45, 759-764.

Mather G, Smith DRR (2004) Combining depth cues: effects upon speed of performance in a depth-ordering task. *Vision Research*, 44, 557-562.

Mosimann UP, Mather G, Wesnes KA, O'Brien DM, Burn DJ, McKeith IG (2004) Visual perception in Parkinson disease dementia and dementia with Lewy bodies. *Neurology*, 63, 2091-2096.

Mather G, Smith DRR (2002) Blur discrimination and its relation to blur-mediated depth perception. *Perception*, 31, 1211-1219.

Mather G (2001) Object-oriented models of cognitive processing. *Trends in Cognitive Sciences*, 5, 182-184.

Anstis S, Smith DRR, Mather G. (2000) Luminance processing in apparent motion, vernier offset, and stereoscopic depth. *Vision Research*, 40, 657-675.

Mather G. (2000) Integration biases in the Ouchi and other visual illusions. *Perception*, 29, 721-727.

Mather G, Smith DRR. (2000) Depth cue integration: stereopsis and image blur. *Vision Research*, 40, 3501-3506.

Brooks K, Mather G. (2000) Perceived speed of motion in depth is reduced in the periphery. *Vision Research*, 40, 3507-3516.

Mather G, Murdoch L (1999) Second-order processing of four-stroke apparent motion. *Vision Research*, 39, 1795-1802.

Anstis S, Verstraten F, Mather G (1998) The motion after-effect. *Trends in Cognitive Sciences*, 2, 111-117.

Mather G, Murdoch L (1998) Evidence for global motion interactions between first-order and second-order stimuli. *Perception*, 27, 761-767.

Mather G, Murdoch L. (1997) Order-specific and non-specific motion responses in the human visual system. *Vision Research*, 37, 605-611.

Mather G (1997) The use of image blur as a depth cue. *Perception*, 26, 1147-1158.

Mather G (1996) Image blur as a pictorial depth cue. *Proceedings of the Royal Society, Series B*, 263, 169-171.

Mather G, Tunley H. (1995) Temporal filtering enhances direction discrimination in random dot patterns. *Vision Research*, 35, 2105-2116.

Mather G, Tunley H. (1995) Motion detection in interleaved random dot patterns: evidence for a rectifying nonlinearity preceding motion analysis. *Vision Research*, 35, 2117-2125.

Mather G, Anstis S M (1995) Second-order texture contrast resolves ambiguous apparent motion. *Perception*, 24, 1373-1382.

Morgan M, Mather G. (1994) Motion detection in two-frame sequences with differing spatial frequency content. *Vision Research*, 34, 197-208.

Mather G, Murdoch L (1994) Gender discrimination in biological motion displays based on dynamic cues. *Proceedings of the Royal Society, Series B*, 258, 273-279.

Mather G, West S. (1993) Evidence for second-order motion detectors. *Vision Research*, 33, 1109-1112.

Mather G, West S. (1993) Recognition of animal locomotion mediated by point-light displays. *Perception*, 22, 759-766.

Mather G, Radford K, West S (1992) Low-level visual processing of biological motion. *Proceedings of the Royal Society, Series B*, 249, 149-155.

Mather G. (1991) First-order and second-order visual processes in the perception of motion and tilt. *Vision Research*, 31, 161-167.

Mather G, Moulden B, O'Halloran A. (1991) Polarity specific adaptation to motion in the human visual system. *Vision Research*, 31, 1013-1019.

Mather G, O'Halloran A, Anstis S. (1991) The spacing illusion: a spatial aperture problem? *Perception*, 20, 387-392.

Mather G. (1990) Computational modelling of motion detectors: responses to two-frame displays. *Spatial Vision*, 5, 1-14.

Mather G. (1989) The role of subjective contours in capture of stereopsis. *Vision Research*, 29, 143-146

Mather G. (1989) Early motion processes and the Kinetic Depth Effect. *Quarterly Journal of Experimental Psychology*, 41, 183-198.

Cavanagh P, Mather G. (1989) Motion: the long and short of it. *Spatial Vision*, 4, 103-129.

Mather G. (1988) Temporal properties of apparent motion in subjective figures. *Perception*, 17, 729-736.

Mather G. (1987) The dependence of edge displacement thresholds on edge blur, contrast, and displacement distance. *Vision Research*, 27, 1631-1637.

Anstis S, Cavanagh P, Maurer D, Lewis T, MacLeod D, Mather G. (1986) Computer generated screening test for colour blindness. *Color Research and Applications*, 11, S63-S66.

Mather G, Morgan M J. (1986) Irradiation: implications for theories of edge localization. *Vision Research*, 26, 1007-1015.

Anstis S, Mather G (1985) Effects of luminance and contrast on direction of ambiguous apparent motion. *Perception*, 14, 167-179.

Mather G, Cavanagh P, Anstis S (1985) A moving display which opposes short-range and long-range signals. *Perception*, 14, 163-166.

Mather G. (1985) Apparent motion from luminance change: further comments on candidate mechanisms. *Vision Research*, 25, 2005-2006.

Cavanagh P, Anstis S, Mather G (1984) Screening for colour blindness using optokinetic nystagmus. *Investigative Ophthalmology and Visual Science*, 25, 463-466.

Morgan M, Mather G, Moulden B, Watt R (1984) Intensity-response non-linearities and the theory of edge localisation. *Vision Research*, 24, 713-720.

Mather G. (1984) Luminance change generates apparent movement: implications for models of directional selectivity in the human visual system. *Vision Research*, 24, 1399-1405.

Moulden B, Renshaw J, Mather G (1984) A two-filter channel for flicker in the human visual system. *Perception*, 13, 387-400.

Mather G, Moulden B (1983) Thresholds for movement direction: two directions are less detectable than one. *Quarterly Journal of Experimental Psychology*, 35, 513-518.

Mather G, Moulden B (1980) A simultaneous shift in apparent direction: further evidence for a 'distribution shift' model of direction coding. *Quarterly Journal of Experimental Psychology*, 32, 325-333.

Mather G. (1980) The movement after-effect and a distribution shift model of direction coding. *Perception*, 9, 379-392.

Moulden B, Mather G (1978) In defense of a ratio model for motion detection at threshold. *Quarterly Journal of Experimental Psychology*, 30, 505-520.

Conference abstracts

Mather, G., Lee, R.J. (2018) Sensation and perception in visual art. *Art & Perception*, 6.

- Mather, G. (2018) The fractal dimension of modern art. *Art & Perception*, 6.
- Georgeson, M., Mather, G., Lee, R.J. (2018) The motion aftereffect without motion: how adaptation to non-directional flicker creates a directional aftereffect in the motion system. *Perception* (1 Suppl.), 47.
- Thornton, I.M., Vuong, Q.C., Mather, G. (2018) Influence of crowd behaviour on estimates of biological motion speed. *Perception* (1 Suppl), 47.
- Lee, R., Mather, G. (2017) After-effects from implied colours of natural objects. *Perception* (1 Suppl), 46.
- Mather, G., Parsons, T. (2017) Adaptation to the locomotion speed of point-light walkers. *Perception* (1 Suppl), 46.
- Ghin, F., Pavan, A., Mather, G. (2017) Investigation of high-frequency transcranial random noise stimulation (hf-tRNS) mechanism on visual motion perception: A stochastic resonance approach. *Perception* (1 Suppl), 46.
- Mather, G. (2017) Visual statistics of large samples of Western artworks. *Art & Perception*, 5, 368.
- Mather, G., Miller, M., Pepperell, R. (2016) Discrimination of blur and local disorder in photographic and artistic images. *Visual Science of Art Conference*, Barcelona, Spain, 26-27th August 2016.
- Ghin, F., Mather, G. Pavan, A. (2016) Effects of different electrical brain stimulations over V5/MT on global motion processing. *Perception* (1 suppl), 45, S243.
- Pavan, S., Foxwell, M., Mather, G. (2016) Effects of attention on form perception and form-motion integration from static and dynamic Glass patterns. *Perception* (1 suppl), 45, S103.
- Mather, G., Sharman, R.J., Parsons, T. (2016) Norm-based coding of human movement speed? *Perception* (1 suppl), 45, S369.
- Mather, G., Sharman, R.J. (2016). Adaptation to human locomotion speed. *Journal of Vision*, 16(12), 397.
- Mather, G., Battaglini, L., Campana, G. (2015) TMS reveals dual processing routes for biological motion processing. *Applied Vision Association Christmas meeting*, London, December 2015.
- Sharman, R.J., Mather, G. (2015) Is adaptation to human motion necessary to change the apparent speed of locomotion? *Perception* (1 suppl), 44, 235.
- Mather, G., Sharman, R.J. (2015) Changes in the apparent speed of human locomotion: Norm-based coding of speed. *Perception* (1 suppl), 44, 231.

- Mather, G. (2015) The depiction of visual space in Canaletto's Venetian vedute. *Visual Science of Art Conference*, Liverpool, UK, 22-23rd August 2015.
- Mather, G., Sharman, R.J. (2014) The effect of implied motion on the motion after-effect. *Perception* (1 suppl), 43, 65.
- Mather, G. (2014) Fractal properties and attractiveness ratings of generative abstract art. *Visual Science of Art Conference*, Belgrade, Serbia, August 2014.
- Mather, G., Bellacosa, R., Pavan, A. (2012) Motion-form interactions beyond the motion integration level: psychophysical evidence for interactions between orientation and optic flow signals. *Perception* (1 suppl), 41, 179.
- Mather, G. (2012) Image preference and visual statistics. *Visual Science of Art Conference*, Alghero, Italy, September 2012.
- Mather, G., Pavan, A., Contillo, A. (2012) Modelling adaptation using the Adelson-Bergen energy sensor. *Journal of Vision*, 12(9), 763.
- Mather, G., Pavan, A., Bellacosa, R. (2011) Static gratings modulate motion after-effect duration but not direction. *Applied Vision Association Christmas Meeting*, York, December 2011.
- Mather, G., Battaglini, L. (2011). A simple model of position effects in apparent motion perception. *Perception* (1 suppl), 40, 176.
- Pavan, A., Mather, G., Bellacosa, R., Casco, (2011) Psychophysical evidence for interactions between visual form and motion signals during motion integration in cortical area MT. *Perception* (1 suppl), 40, 26.
- Mather, G., Challinor, K. (2011) Psychophysical evidence for spatiotemporal tuning in human motion sensing receptive fields. *Asia-Pacific Conference on Vision*, Hong Kong, July 2011.
- Mather, G. (2010) Body proportion as a cue for the perception of human stature. *Applied Vision Association Easter Meeting*, Liverpool, April 2010.
- Mather, G., Challinor, K. (2010) Psychophysical tests of the motion energy model. *Perception*, 39 (1 suppl), 152.
- Pavan, A., Casco, C., Mather, G., Campana, G. (2009) Two mechanisms for detecting spatial contours defined by motion. *Perception*, 38 (1 suppl), 42.
- Challinor, K., Mather, G. (2009) Biphasic temporal response of low-level motion detectors in human vision revealed by a direction discrimination task. *Perception*, 38 (1 suppl), 8.

- Pavan, A., Mather, G. (2008) Distinct position assignment mechanisms revealed by cross-order motion. *Perception*, 37, S68.
- Mather, G., Pavan, A. (2008) Motion-induced position shifts occur after motion integration. *Perception*, 37 (1 suppl), 83.
- Mather, G. (2007) Two-stroke apparent motion is abolished at low luminance. *Perception*, 36 (1 suppl), 36.
- Mather, G. (2006) Where is the sense in low-level motion? *Perception*, 35 (1 suppl), 69.
- Mather, G. (2006) Motion after-effects from two-stroke apparent motion. *Journal of Vision*, 6(6), 549.
- Rogers, J., Hamilton, R., Mather, G. (2005) Motion perception in art and design research. *Perception*, 34 (1 suppl), 90.
- Mather, G., Hamilton, R., Rogers, J. (2005) Perception of phase wave motion. *Perception*, 34 (1 suppl), 12.
- Daniell, A., Mather, G. (2003) Dmax in the Fourier domain. *Perception*, 32 (suppl), 103.
- Thompson, B., Mather, G. (2003) Discriminating the biological motion of animals. *Journal of Vision*, 3(9), 529.
- Mather, G., Daniell, A. (2003) Direction discrimination performance measured using a Fourier domain signal-to-noise paradigm. *Journal of Vision*, 3(9), 283.
- Thompson, B., Mather, G. (2002) The role of motion cues in the recognition of animals. *Perception*, 31 (1 suppl), 120.
- Daniell, A., Mather, G. (2002) The spatiotemporal autocorrelation spectrum bridges energy-based and feature-based accounts of motion. *Perception*, 31 (1 suppl), 136.
- Mather, G., Daniell, A. (2002) Separating energy-based and feature-based accounts of motion discrimination in random-dot kinematograms. *Perception*, 31 (1 suppl), 99.
- Daniell, A., Mather, G. (2001) Modelling random block kinematogram performance with edge statistics. *Invest. Ophthalm. Vis. Sci.Supp.*, 42, 870.
- Mather, G., Thompson, B. (2001) Stationary pedestals during adaptation reduce motion after-effect duration. *Invest. Ophthalm. Vis. Sci.Supp.*, 42, 532.
- Nakayama, M., Mather, G. (2000) Object recognition in the mental rotation of line-drawn and dot-defined objects. *Perception*, 29 (1 suppl), 115.

- Mather, G. (2000) Blur discrimination and its relation to blur-mediated depth perception. *Perception*, 29 (1 suppl), 120.
- Mather, G. (1999) Blur discrimination and its relation to blur-mediated depth perception. *Applied Vision Association Christmas Meeting*, Birmingham, December 1999.
- Mather, G., Smith, D. (1999) Blur and stereoscopic disparity interactions influence depth perception. *Perception*, 28 (1 suppl), 131.
- Anstis, S., Smith, D., Mather, G. (1998) Linear luminance processing in motion and flicker. *Perception*, 27 (1 suppl), 51.
- Nakayama, M., Mather, G. (1998) Mental Rotation of dot-defined objects. *Perception*, 27 (1 suppl), 122.
- Anstis, S., Smith, D., Mather, G. (1998) Luminance processing in flicker and motion. *Invest. Ophthalm. Vis. Sci. Supp.* 39.
- Mather, G. (1998) Blur-mediated depth cues are available pre-attentively. *Invest. Ophthalm. Vis. Sci. Supp.* 39.
- Mather, G., Murdoch, L. (1996) Second-order four-stroke apparent motion. *Invest. Ophthalm. Vis. Sci. Supp.* 37, 900.
- Mather, G., Murdoch, L. (1995) Attentional control in direction discrimination tasks. *Invest. Ophthalm. Vis. Sci. Supp.* 36, 227.
- Mather, G., Murdoch, L. (1994) Integration of first-order and second-order motion signals in the human visual system. *Perception*, 23 (1 suppl), 27.
- Mather, G., Tunley, H. (1993) Temporal filtering enhances motion detection. *Perception*, 22 (1 suppl), 31.
- Mather, G. (1993) MAEs from barberpole stimuli. *Waterfall Illusion Conference*, Falls of Foyers, Scotland, August, 1993.
- Mather, G. (1990) Spatial and temporal polarity specificity of motion adaptation. *Perception*, 19 (1 suppl), 8.
- Mather, G. (1988) Models of the motion detector: which ones predict known illusions of movement? *Perception*, 17 (1 suppl), 350.
- Mather, G. (1986) Spatial and temporal determinants of motion discrimination thresholds. *Invest. Ophthalm. Vis. Sci. Supp.* 27, 344.
- Mather, G. (1985) Irradiation: a challenge for theories of edge localisation? *Perception*, 14 (1 suppl), 30.

Mather, G. (1984) What primitive features are used to detect motion? *Perception*, 13 (1 suppl), 18.

Mather, G., Cavanagh, P., Anstis, S. (1983) Screening for colour-blindness by making use of optokinetic nystagmus. *Perception*, 12 (1 suppl), 10.

Anstis, S., Mather, G. (1983) Effects of luminance and contrast on direction of ambiguous apparent motion. *Ophthalm. Vis. Sci. Supp.* 24, 277.

Books

Mather, G. (2016) *Foundations of Sensation and Perception*. 3rd ed. Routledge, Abingdon.

Mather, G. (2014) *Eye, Brain, and Art: The Psychology of Visual Art*. Cambridge University Press, Cambridge.

Mather, G. (2011) *Essentials of Sensation and Perception*. Routledge, Hove.

Mather, G. (2009) *Foundations of Sensation and Perception*. 2nd ed. Psychology Press, Hove.

Mather G, Verstraten F, Anstis S. (1998) Eds. *The Motion Aftereffect: A Modern Perspective*. MIT Press, Cambridge Mass.

Book chapters

Mather, G. (2018) Sensation and Perception. In: Davey, G.C. (Ed) *Psychology* (p. 324-381). Wiley.

Mather, G. (2017) Two-stroke apparent motion. In: Shapiro, A.G., & Todorovic, D. (Eds) *The Oxford Compendium of Visual Illusions*. (p. 531-535) Oxford University Press, Oxford.

Mather, G. (2015) Computational approaches to perception: Beyond Marr's (1982) computational approach to vision. In: Eysenck, M. & Groome, D. (Eds). *Cognitive Psychology: Revisiting the Classic Studies*. Sage.

Mather, G. (2010). Motion perception: Behavior and neural substrate. *Wiley Interdisciplinary Reviews: Cognitive Science*.

Mather G. Vision. (2008) In: S Davis, W Buskist (Eds) *21st Century Psychology: A Reference Handbook*. Sage, Los Angeles.

Mather G (2006) Psychology of motion perception. Entry in *Encyclopedia of Cognitive Science*. Macmillan.

Mather G (2004) Perceptual and cognitive limits on driver information processing. In: PRN Childs, RK Stobart (Eds) *Total Vehicle Technology*. Professional Engineering Publishing, Bury St Edmunds.

Mather G. (1994) Motion detector models: psychophysical evidence. In: AT Smith, RJ Snowden (Eds) *Visual Detection of Motion*. Academic Press, London.