

Casimir Ludwig

University of Bristol School of Psychological Science
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Academic qualifications

PhD Experimental Psychology, University of Bristol, 2003.

Thesis title: Stimulus-driven and goal-driven control over visual selection.

M.A. Neuropsychology (distinction), Radboud University Nijmegen, 1999.

Employment

Professor of Cognitive Science, School of Psychological Science, University of Bristol, August 2023.

Reader in Experimental Psychology (Associate Professor), School of Psychological Science, University of Bristol, August 2012–July 2023 (proleptic appointment).

EPSRC Advanced Research Fellow (promoted to Senior Research Fellow in 2011), School of Experimental Psychology, University of Bristol, March 2008–February 2013.

Research Associate (promoted to Research Fellow in 2006) School of Experimental Psychology, University of Bristol, November 2004–February 2008.

Post-doctoral Research Assistant, School of Experimental Psychology, University of Bristol, November 2002–October 2004.

Peer-reviewed publications

Costantini, I., Montout, A., Moran, P., Kounali, D., Pearson, R.M., & Ludwig, C.J.H. (in press). Investigating learning, decision-making, and mental health in pregnancy: Insights from a UK cohort study. *Computational Psychiatry*.

Chapman, W., & Ludwig, C.J.H. (in press). Disentangling decision uncertainty and motor noise in curved movement trajectories. *Journal of Vision*.

Hadjipanayi, V., Zhu-Dong, D., Ludwig, C.J.H., & Kent, C. (2025). Unequal attention allocation during Multiple Object Tracking: Evidence from an eye-tracking study. *Quarterly Journal of Experimental Psychology*.
[doi:10.1177/17470218251362833](https://doi.org/10.1177/17470218251362833)

Ludwig, C.J.H., Stuchlý, E., & Malhotra, G. (2025). Grounding computational cognitive models. *Psychological Review*, 132, 973–1001. [doi:10.1037/rev0000533](https://doi.org/10.1037/rev0000533).

Garibbo, M., Ludwig, C.J.H., Lepora, N.F., & Aitchison, L. (2025). Relating human error-based learning to modern deep RL algorithms. *Neural Computation*, 37, 128–159, [doi:10.1162/neco-a-01721](https://doi.org/10.1162/neco-a-01721).

Han, Q., Quadflieg, S., & Ludwig, C.J.H. (2023). Decision avoidance and post-decision regret: a systematic review and meta-analysis. *PLoS ONE*, 18(10), e0292857, [doi:10.1371/journal.pone.0292857](https://doi.org/10.1371/journal.pone.0292857).

Hadjipanayi, V., Ludwig, C.J.H., & Kent, C. (2023). Graded prioritisation of targets in search: Reward diminishes the low prevalence effect. *Cognitive Research: Principles and Implications*, 8, 52, [doi:10.1186/s41235-023-00507-9](https://doi.org/10.1186/s41235-023-00507-9).

Ez-zizi, A., Farrell, S., Leslie, D., Malhotra, G., & Ludwig, C.J.H. (2023). Reinforcement learning under uncertainty: Expected versus unexpected uncertainty and state versus reward uncertainty. *Computational Brain & Behavior*, [doi:10.1007/s42113-022-00165-y](https://doi.org/10.1007/s42113-022-00165-y).

Montera, M.L., Bowers, J., Ponte-Costa, R., Ludwig, C.J.H., & Malhotra, G. (2022). Lost in latent space: Examining failures of disentangled models at combinatorial generalisation. *Neural Information Processing Systems*, 35, 10136–10149.

Hadjipanayi, V., Shimi, A., Ludwig, C.J.H., & Kent, C. (2022). Unequal allocation of overt and covert attention in Multiple Object Tracking. *Attention, Perception, & Psychophysics*, 84, 1519–1537, [doi:10.3758/s13414-022-02501-7](https://doi.org/10.3758/s13414-022-02501-7).

Santangelo, A.P., Ludwig, C.J.H., Navajas, J., Sigman, M., & Leone, M.J. (2022). Background music changes the policy of human decision-making: Evidence from experimental and drift-diffusion model-based approaches on different decision tasks. *Journal of Experimental Psychology: General*, 151, 2222–2236,
[doi: 10.1037/xge0001189](https://doi.org/10.1037/xge0001189).

- Stewart, E.E.M., Ludwig, C.J.H., & Schütz, A.C. (2022). Humans represent the precision and utility of information acquired across fixations. *Scientific Reports*, 12(1): 1–13, doi:[10.1038/s41598-022-06357-7](https://doi.org/10.1038/s41598-022-06357-7).
- Sullivan, B., Ludwig, C.J.H., Damen, D., Mayol-Cuevas, W., & Gilchrist, I.D. (2021). Look-ahead fixations during visuomotor behavior: Evidence from assembling a camping tent. *Journal of Vision*, 21: 13, doi: [10.1167/jov.21.3.13](https://doi.org/10.1167/jov.21.3.13).
- Blything, R., Biscione, V., Vankov, I., Ludwig, C.J.H., & Bowers, J.S. (2021). The human visual system and CNNs can both support robust online translation tolerance following extreme displacements. *Journal of Vision*, 21: 9, doi: [10.1167/jov.21.2.9](https://doi.org/10.1167/jov.21.2.9).
- Montera, M.L., Ludwig, C.J.H., Ponte-Costa, R., Malhotra, G., Bowers, J. (2021). The role of disentanglement in generalisation. *International Conference on Learning Representations*, openreview.net/forum?id=qbH974jKUVy
- Attwood, A.S., Ludwig, C.J.H., Penton-Voak, I.S., Poh, J., Kwong, A.S.F., & Munafò, M.R. (2021). Effects of state anxiety on gait: A 7.5% carbon dioxide challenge study. *Psychological Research*, doi: [10.1007/s00426-020-01393-2](https://doi.org/10.1007/s00426-020-01393-2).
- Fradkin, I., Ludwig, C., Elder, E., & Huppert, J.D. (2020). Doubting what you already know: uncertainty regarding state transitions is associated with obsessive compulsive symptoms. *PLoS Computational Biology*, 16(2): e1007634, doi: [10.1371/journal.pcbi.1007634](https://doi.org/10.1371/journal.pcbi.1007634).
- Xiong, C., Ceja, C., Ludwig, C.J.H., & Franconeri, S. (2020). Biased Average Position Estimates in Line and Bar Graphs: Underestimation, Overestimation, and Perceptual Pull. *IEEE Transactions on Visualization and Computer Graphics*, 26, 301–310, doi: [10.1109/TVCG.2019.2934400](https://doi.org/10.1109/TVCG.2019.2934400).
- Jang, Y., Sullivan, B., Ludwig, C., Gilchrist, I., Damen, D., & Mayol-Cuevas, W. (2019). EPIC-tent: An egocentric video dataset for camping tent assembly. *ICCV Workshop on Egocentric Perception, Interaction and Computing*.
- Malhotra, G., Leslie, D.S., Ludwig, C.J.H., & Bogacz, R. (2018). Time-varying decision boundaries: insights from optimality analysis. *Psychonomic Bulletin & Review*, 25, 971–996, doi: [10.3758/s13423-017-1340-6](https://doi.org/10.3758/s13423-017-1340-6).
- Ludwig, C.J.H., Alexander, N., Howard, K.L., Jedrzejewska, A.A., Mundkur, I., Redmill, D.W. (2018). The influence of visual flow and perceptual load on locomotion speed. *Attention, Perception, & Psychophysics*, 80, 69–81, doi: [10.3758/s13414-017-1417-3](https://doi.org/10.3758/s13414-017-1417-3).
- Mégardon, G., Ludwig, C.J.H., & Sumner, P. (2017). Trajectory curvature in saccade sequences: spatiotopic influences vs residual motor activity. *Journal of Neurophysiology*, 117, 1310–1320, doi: [10.1152/jn.00110.2017](https://doi.org/10.1152/jn.00110.2017).
- Malhotra, G., Leslie, D.S., Ludwig, C.J.H., & Bogacz, R. (2017). Overcoming indecision by changing the decision boundary. *Journal of Experimental Psychology: General*, 146, 776–805, doi: [10.1037/xge0000286](https://doi.org/10.1037/xge0000286).
- Mason, A., Farrell, S., Howard-Jones, P., & Ludwig, C.J.H. (2017). The role of reward and reward uncertainty in episodic memory. *Journal of Memory and Language*, 96, 62–77, doi: [10.1016/j.jml.2017.05.003](https://doi.org/10.1016/j.jml.2017.05.003).
- Mason, A., Ludwig, C., & Farrell, S. (2017). Adaptive scaling of reward in episodic memory: A replication study. *Quarterly Journal of Experimental Psychology*, 70, 2306–2318, doi: [10.1080/17470218.2016.1233439](https://doi.org/10.1080/17470218.2016.1233439).
- Ludwig, C.J.H., & Evens, D.R. (2017). Information Foraging for Perceptual Decisions. *Journal of Experimental Psychology: Human Perception & Performance*, 43, 245–264, doi: [10.1037/xhp0000299](https://doi.org/10.1037/xhp0000299).
- Bowers, J.S., Vankov, I.I., & Ludwig, C.J.H. (2016). The visual system supports on-line translation invariance for object identification. *Psychonomic Bulletin & Review*, 23, 432–438, doi: [10.3758/s13423-015-0916-2](https://doi.org/10.3758/s13423-015-0916-2).
- Ludwig, C.J.H., Davies, J.R., & Eckstein, M.P. (2014). Foveal analysis and peripheral selection during active visual sampling. *Proceedings of the National Academy of Sciences*, 111(2), E291–E299, doi: [10.1073/pnas.1313553111](https://doi.org/10.1073/pnas.1313553111).
- Cassey, T.C., Evens, D.R., Bogacz, R., Marshall, J.A.R., & Ludwig, C.J.H. (2013). Adaptive Sampling of Information in Perceptual Decision-Making. *PLoS ONE*, 8(11): e78993, doi: [10.1371/journal.pone.0078993](https://doi.org/10.1371/journal.pone.0078993).
- Ludwig, C.J.H., Davies, J.R., & Gegenfurtner, K.R. (2012). A functional role for trans-saccadic luminance differences. *Journal of Vision*, 12(13):14, 1–21, doi: [10.1167/12.13.14](https://doi.org/10.1167/12.13.14).
- Ludwig, C.J.H., Farrell, S., Ellis, L.A., Hardwicke, T.E., & Gilchrist, I.D. (2012). Context-gated statistical learning and its role in visual-saccadic decisions. *Journal of Experimental Psychology: General*, 141, 150–169, doi: [10.1037/a0024916](https://doi.org/10.1037/a0024916).
- Ludwig, C.J.H., & Davies, J.R. (2011). Estimating the growth of internal evidence guiding perceptual decisions. *Cognitive Psychology*, 63, 61–92, doi: [10.1016/j.cogpsych.2011.05.002](https://doi.org/10.1016/j.cogpsych.2011.05.002).

- Etchells, P.J., Ludwig, C.J.H., Benton, C.P., & Gilchrist, I.D. (2011). Testing a simplified method for measuring velocity integration in saccades using a manipulation of target contrast. *Frontiers in Psychology*, 2, 115, doi: [10.3389/fpsyg.2011.00115](https://doi.org/10.3389/fpsyg.2011.00115).
- Ludwig, C.J.H. (2011). Saccadic decision-making. In S.P. Livsedge, I.D. Gilchrist, and S. Everling (Eds.), *The Oxford Handbook of Eye Movements*. Oxford: OUP, doi: [10.1093/oxfordhb/9780199539789.013.0023](https://doi.org/10.1093/oxfordhb/9780199539789.013.0023).
- Farrell, S., Ludwig, C.J.H., Ellis, L.A., & Gilchrist, I.D. (2010). The influence of environmental statistics on inhibition of saccadic return. *Proceedings of the National Academy of Sciences*, 107, 929-934, doi: [10.1073/pnas.0906845107](https://doi.org/10.1073/pnas.0906845107).
- Evens, D.R., & Ludwig, C.J.H. (2010). Dual-task costs and benefits in anti-saccade performance. *Experimental Brain Research*, 4, 545-557, doi: [10.1007/s00221-010-2393-1](https://doi.org/10.1007/s00221-010-2393-1).
- Etchells, P.J., Benton, C.P., Ludwig, C.J.H., & Gilchrist, I.D. (2010). The target velocity integration function for saccades. *Journal of Vision*, 10, 7, doi: [10.1167/10.6.7](https://doi.org/10.1167/10.6.7).
- Ludwig, C.J.H. (2009). Temporal integration of sensory evidence for saccade target selection. *Vision Research*, 49, 2764-2773, doi: [10.1016/j.visres.2009.08.012](https://doi.org/10.1016/j.visres.2009.08.012).
- Ludwig, C.J.H., Farrell, S., Ellis, L.A., & Gilchrist, I.D. (2009). The mechanism underlying inhibition of saccadic return. *Cognitive Psychology*, 59, 180-202, doi: [10.1016/j.cogpsych.2009.04.002](https://doi.org/10.1016/j.cogpsych.2009.04.002).
- Cooper, R.M., Rowe, A.C., Penton-Voak, I.S., & Ludwig, C.J.H. (2009). No reliable effects of emotional facial expression, adult attachment orientation, or anxiety on the allocation of visual attention in the spatial cueing paradigm. *Journal of Research in Personality*, 43, 643-652, doi: [10.1016/j.jrp.2009.03.005](https://doi.org/10.1016/j.jrp.2009.03.005).
- Stephen H. Butler, Stephanie Rossit, Iain D. Gilchrist, Casimir J.H. Ludwig, Bettina Olk, Keith Muir, Ian Reeves, & Monika Harvey (2009). Non-lateralised deficits in anti-saccade performance in patients with hemispatial neglect. *Neuropsychologia*, 47, 2488-2495. doi: [10.1016/j.neuropsychologia.2009.04.022](https://doi.org/10.1016/j.neuropsychologia.2009.04.022).
- Ludwig, C.J.H., Butler, S.H., Rossit, S., Harvey, M., & Gilchrist, I.D. (2009). Modelling contralesional movement slowing after unilateral brain damage. *Neuroscience Letters*, 452, 1-4, doi: [10.1016/j.neulet.2009.01.033](https://doi.org/10.1016/j.neulet.2009.01.033).
- Skelton, R., Ludwig, C.J.H., & Mohr, C. (2009). A novel, illustrated questionnaire to distinguish projector and associator synaesthetes. *Cortex*, 45, 721-729, doi: [10.1016/j.cortex.2008.02.006](https://doi.org/10.1016/j.cortex.2008.02.006).
- Farrell, S., & Ludwig, C.J.H. (2008). Bayesian and maximum likelihood estimation of hierarchical response time models. *Psychonomic Bulletin & Review*, 15, 1209-1217, doi: [10.3758/PBR.15.6.1209](https://doi.org/10.3758/PBR.15.6.1209).
- Ludwig, C. J. H., Ranson, A., & Gilchrist, I. D. (2008). Oculomotor capture by transient events: A comparison of abrupt onsets, offsets, motion, and flicker. *Journal of Vision*, 8, 11. doi: [10.1167/8.14.11](https://doi.org/10.1167/8.14.11).
- Ludwig, C.J.H., Mildinhal, J.W., & Gilchrist, I.D. (2007). A population coding account for systematic variation in saccadic dead time. *Journal of Neurophysiology*, 97, 795-805, doi: [10.1152/jn.00652.2006](https://doi.org/10.1152/jn.00652.2006).
- Ludwig, C.J.H., Eckstein, M.P., & Beutter, B.R. (2007). Limited flexibility in the filter underlying saccadic target-ing. *Vision Research*, 47, 280-288, doi: [10.1016/j.visres.2006.09.009](https://doi.org/10.1016/j.visres.2006.09.009).
- Butler, S.H., Gilchrist, I.D., Ludwig, C.J.H., Muir, K., & Harvey, M. (2006). Impairments of oculomotor control in a patient with a right temporo-parietal lesion. *Cognitive Neuropsychology*, 23, 990-999, doi: [10.1080/13594320600768847](https://doi.org/10.1080/13594320600768847).
- Ludwig, C.J.H., & Gilchrist, I.D. (2006). The relative contributions of luminance contrast and task demands on saccade target selection. *Vision Research*, 46, 2743-2748, doi: [10.1016/j.visres.2006.02.012](https://doi.org/10.1016/j.visres.2006.02.012).
- Ludwig, C.J.H., Gilchrist, I.D., McSorley, E., & Baddeley, R.J. (2005). The temporal impulse response underlying saccadic decisions. *The Journal of Neuroscience*, 25, 9907-9912, doi: [10.1523/JNEUROSCI.2197-05.2005](https://doi.org/10.1523/JNEUROSCI.2197-05.2005).
- Peers, P.V., Ludwig, C.J.H., Rorden, C., Cusack, R., Bonfiglioli, C., Bundesen, C., Driver, J., Antoun, N., & Duncan, J. (2005). Attentional functions of parietal and frontal cortex. *Cerebral Cortex*, 15, 1469-1484, doi: [10.1093/cercor/bhi029](https://doi.org/10.1093/cercor/bhi029).
- Ludwig, C.J.H., Gilchrist, I.D., & McSorley, E. (2005). The remote distractor effect in saccade programming: Channel interactions and lateral inhibition. *Vision Research*, 45, 1177-1190, doi: [10.1016/j.visres.2004.10.019](https://doi.org/10.1016/j.visres.2004.10.019).
- Ludwig, C.J.H., Gilchrist, I.D., & McSorley, E. (2004). The influence of spatial frequency and contrast on saccade latencies. *Vision Research*, 44, 2597-2604, doi: [10.1016/j.visres.2004.05.022](https://doi.org/10.1016/j.visres.2004.05.022).
- Ludwig, C.J.H., & Gilchrist, I.D. (2003). Goal-driven modulation of oculomotor capture. *Perception & Psychophysics*, 65, 1243-1251, doi: [10.3758/BF03194849](https://doi.org/10.3758/BF03194849).
- Ludwig, C.J.H. & Gilchrist, I.D. (2003). Target similarity affects saccade curvature away from irrelevant onsets. *Experimental Brain Research*, 152, 60-69, doi: [10.1007/s00221-003-1520-7](https://doi.org/10.1007/s00221-003-1520-7).

Ludwig, C.J.H. & Gilchrist, I.D. (2002). Measuring saccade curvature: A curve-fitting approach. *Behavior Research Methods, Instruments, and Computers*, 34, 618-624, doi: [10.3758/BF03195490](https://doi.org/10.3758/BF03195490).

Ludwig, C.J.H. & Gilchrist, I.D. (2002). Stimulus-Driven and Goal-Driven Control over Visual Selection. *Journal of Experimental Psychology: Human Perception and Performance*, 28, 902-912, doi: [10.1037/0096-1523.28.4.902](https://doi.org/10.1037/0096-1523.28.4.902).

Grants

Ludwig, C.J.H. (2021–2023). Likelihood-free dynamical models of sequential fixation control. *Leverhulme Trust Research Fellowship*, £50k.

Pearson, R., Lawlor, D., Ludwig, C., Skinner, A., Tilling, K., Caldwell, D., Culpin, I., & Jones, H. (2017-2022). Genetic, behavioural and cognitive mechanisms underpinning the association between mother and offspring mental health problems: mental (M) health (H) intergenerational transmission (INT) -(MHINT). *Horizon 2020 ERC*, £1.18m.

Mayol-Cuevas, W., Damen, D., Gilchrist, I., & Ludwig, C. (2016-2020). GLANCE: GLAnceable Nuances for Contextual Events. *Engineering and Physical Sciences Research Council*, £807k.

Bull, D., Burn, J., Canagarajah, N., Cuthill, I., Gilchrist, I., Ludwig, C., & Roberts, N. (2015–2020). Vision for the future. *Engineering and Physical Sciences Research Council*, £1.4m.

Gilchrist, I.D., Leslie, D., Baddeley, R., Bogacz, R., Farrell, S., Ludwig, C.J.H., & McNamara, J. (2011–2015). Decision-making in an unstable world. *Engineering and Physical Sciences Research Council*, £1.6m.

Ludwig, C.J.H., Burn, J.F., Leonard, U., & Bull, D.R. (2010–2014). Bristol Vision Institute Laboratory. *The Wellcome Trust*, equipment grant, £390k.

Ludwig, C.J.H. (2008–2013). Integrating 'when' and 'where' in models of saccade target selection. *Engineering & Physical Sciences Research Council*, Advanced Research Fellowship, £700k.

Ludwig, C.J.H. & Gilchrist, I.D. (2006–2007). The salience of luminance transients to the saccadic eye movement system. *Engineering & Physical Sciences Research Council*, £120k.

Farrel, S., Ludwig, C.J.H., Gilchrist, I.D., & Carpenter, R.H.S. (2006–2009). Modelling sequential effects in saccadic choice. *The Wellcome Trust*, £119k.

Rowe, A.C., Penton-Voak, I.S., & Ludwig, C.J.H. (2006–2009). Adult attachment and the perceptual processing of facial expressions of emotion. *Economic & Social Research Council*, £370k.

Ludwig, C.J.H. (2005). The perceptual template governing saccadic decisions. *Engineering & Physical Sciences Research Council*, Overseas Travel Grant, £6k.

Visiting positions

Visiting Scientist, University of Potsdam, SFB 1294 grant on Data Assimilation (Ralf Engbert & Sebastian Reich), 2018.

Visiting Scientist, Universidad Torcuato di Tella, Buenos Aires, Argentina, 2015.

Visiting Scientist, University of California Santa Barbara, US, 2005, 2011.

Medical Research Council–Cognition and Brain Sciences Unit, Summer Studentship, 1999.

Teaching

Undergraduate

Year 2 Brain & Cognition (2019–present).

Year 3 Contemporary Issues/Current Topics in Psychology (2013–present): seminar series on a variety of topics (e.g. perception, action, decision-making).

Year 3 Dissertation projects (2012–present).

Year 2 Biological Psychology (2012–2019).

Year 1 Biological Psychology (2012–2014).

Lab demonstrator throughout my undergraduate degree and PhD on units related to IT skills, research methods and statistics (1997–2002).

Post-graduate: MSc

Cognitive Psychology (MSc Conversion; 2025–).
 Brain & Cognition (MSc Conversion; 2019–2021).
 Dissertation projects (2012–present).
 Biological Psychology (MSc Conversion; 2017–2019).
 Academic careers sessions (2016–2018).
 Neuropsychological Analysis Tools (2014–2017): Recording and analysing movements.
 Generic Research Skills (2003–2016): Ethics; APA style; Academic careers.
 Functional Neuroanatomy and Neuroscience Methods (2009–2010): Eye movements.
 Foundations of Vision (2008–2009): Eye movements.

Research supervision and examination

PhD supervision

Georgine Keggins, 2025– (at Queen Mary University of London, co-supervision with [Emma Stewart](#)).
 Michele Garibbo, 2020–2024 (co-supervisor, Wellcome Trust-funded).
 Will Chapman, 2016–2023 (EPSRC-funded).
 Veronika Hadjipanayi, 2019–2023 (co-supervisor).
 Ilaria Costantini, 2018–2023 (co-supervisor, ERC-funded).
 Qing Han, 2017–2022 (part UoB-funded).
 Alice Mason, 2011–2016 (EPSRC-funded).
 David Evens, 2009–2014 (EPSRC-funded).
 Peter Etchells, 2007–2010 (co-supervisor).

MSc by Research supervision

Tom Hawkings, 2023–2024 (co-supervisor).
 Erik Stuchlý, 2020–2021.
 Joe Wilson, 2019–2021 (co-supervisor).

Examination

PhD examination: University of Queensland; Humboldt Universität zu Berlin; University of Cardiff; University of Potsdam; Université de Lille; University of Oxford; University of Birmingham; 9 internal at University of Bristol.
 MSc by Research examination: 4 internal.

Administration

Admissions Officer - UG Recruitment (2022–present).
 Unit director year 2 / MSc Brain & Cognition (2019–present).
 Year 2 coordinator (2019–2021).
 Deputy School Education Director (PGT focus; 2016–2020).
 Programme director MSc Research Methods (2014–2017).
 Programme director MSc Neuropsychology (2013–2017).
 Student Placement co-ordinator (2012–2020).
 Unit director Biological Psychology (year 2 BSc 2013–2019; MSc Conversion 2017–2019).
 Member of the Faculty of Engineering Ethics Committee (2009–2011).
 Member of the Faculty of Science Human Research Ethics Committee (2004–2014).
 Unit director year 1 Biological Psychology (2012–2013).

Invited talks at conferences/workshops

Keynote at 'Model-based Neuroscience' Summer School, Amsterdam, 2023; Workshop on 'From Peripheral to Transsaccadic and Foveal Perception', Rauischholzhausen, Germany, 2019; Workshop on 'Cognitive and Motor Processes in Visual Attention', Durham, UK, 2019; MRC Doctoral Training Programme workshop on 'Computational Modelling', UK, 2018; Royal Society meeting on 'Understanding images in biological and computer vision', UK, 2018; Workshop on 'Learning at the Interface of Vision and Oculomotor Control', Humboldt University Berlin, Germany, 2016; DSTL Knowledge Network Meeting, Winfrith Technology Centre, Winfrith, UK, 2008; AGM of the European Brain and Behaviour Society, Dublin, Ireland, 2005.

Invited seminars

SUNY Albany, 2024, USA; University of Amsterdam, 2023, Netherlands; University of Nottingham, 2023; University of Potsdam, Germany, 2022, 2017, 2012; Humboldt University Berlin, Germany, 2022, 2018; Paris Descartes University, France, 2017; University of Cardiff, UK, 2016; University of Bielefeld, Germany, 2016; Aston University, UK, 2015; Universidad Torcuato Di Tella, Buenos Aires, Argentina, 2015; University of Wales, Bangor, 2014; University of California Irvine, 2014; University of Southampton, UK, 2014; University of Giessen, Germany, 2009; University of Birmingham, UK, 2009; University of Strathclyde, UK, 2009; University of Geneva, Switzerland, 2008; University of Cardiff, UK, 2008; University of Leicester, UK, 2007; Smith-Kettlewell Eye Research Institute, US, 2005; NASA Ames Research Centre, US, 2005; University of Nottingham, 2003; Royal Holloway, University of London, UK, 2002; Medical Research Council – Cognition & Brain Sciences Unit, 2000.

Professional activity

External Examiner MSc Computational Neuroscience & Cognitive Robotics; MSc Brain Imaging and Cognitive Neuroscience; MSc Psychology at University of Birmingham (2019–2023).

Associate Editor of The Quarterly Journal of Experimental Psychology (2017–2020).

Member of the EPSRC college (2008–present).

Reviewer for *ACM Transactions on Applied Perception*; *Attention, Perception, & Psychophysics*; *Behavior Research Methods*; *Brazilian Journal of Medical and Biological Research*; *Cognition*; *Computational Brain & Behavior*; *Cortex*; *Ergonomics*; *Experimental Brain Research*; *Frontiers in Neuroscience*; *Journal of Cognitive Neuroscience*; *Journal of Experimental Psychology: General*; *Journal of Experimental Psychology: Human Perception & Performance*; *Journal of Mathematical Psychology*; *Journal of Neurophysiology*; *Journal of Neuroscience*; *Journal of Social and Personal Relationships*; *Journal of Vision*; *Nature Communications*; *Open Mind*; *Perception/iPerception*; *PLoS Computational Biology*; *PLoS ONE*; *Proceedings of the National Academy of Sciences*; *Proceedings of the Royal Society B: Biological Sciences*; *Psychological Review*; *Psychological Science*; *Psychonomic Bulletin & Review*; *Psychopharmacology*; *Quarterly Journal of Experimental Psychology*; *Spatial Vision*; *Vision Research*; *Visual Cognition*.

Reviewer for *Agence National Recherche*; *Biotechnology & Biological Sciences Research Council*; *British Academy*; *Economic & Social Research Council*; *Einstein Foundation*; *Engineering & Physical Sciences Research Council*; *European Research Council (ERC)*; *Flanders Research Foundation (FWO)*; *Help the Aged*; *The Leverhulme Trust*; *Medical Research Council*; *National Science Foundation*; *Swiss National Science Foundation*; *Wellcome Trust*.

Instructor on the Summer School on Computational Modelling of Cognition, 2014–present (bi-annual).

Member of Applied Vision Association, British Machine Vision Association, Society for Mathematical Psychology, Experimental Psychology Society.

Fellow of the Psychonomic Society.

Fellow of the Higher Education Authority

Languages: Dutch (native); English (native level); German (basic).

Appendix

Miscellaneous publications

Ludwig, C.J.H. (2002). Visual attention and cortical circuits. *Perception*, 31, 513-514. (book review)

Peer-reviewed conference presentations

Heinke, D., Ludwig, C., & Deakin, J. (2025). Do time-dependent decision boundaries exist? Evidence from empirical data from random-dot kinematograms (RDK) and a drift-diffusion model. *Annual meeting of the Vision Sciences Society*.

Malhotra, G., Stuchlý, E., & Ludwig, C. (2024). The best fit is not the best model: On the need for identifying how participants navigate the cognitive parameter space. *Annual meeting Psychonomic Society*.

Ludwig, C., Stuchlý, E., & Malhotra, G. (2023). Navigating cognitive parameter space. *Annual meeting Society for Mathematical Psychology*.

Stuchlý, E., Ludwig, C., & Malhotra, G. (2022). Testing the optimisation hypothesis by tracking changes in decision strategy in a reward maximisation task. *Annual meeting Society for NeuroEconomics*.

Garibbo, M., Ludwig, C., Lepora, N., & Aitchison, L. (2022). What deep reinforcement learning tells us about human motor learning and vice-versa. *Cold Spring Harbor Laboratory meeting: From Neuroscience to Artificially Intelligent*.

Stuchlý, E., Malhotra, G., & Ludwig, C. (2022). Defining one's boundaries: Exploration of the decision threshold parameter space during a reward maximisation task. *Annual meeting Society for Mathematical Psychology* (virtual).

Chapman, W., & Ludwig, C. (2022). The effects of perceptual uncertainty on reach to grasp movements. *Annual Meeting Vision Sciences Society*.

Hadjipanayi, V., Ludwig, C.J.H., & Kent, C. (2021). Unequal allocation of spatial attention in Multiple Object Tracking. *European Conference on Visual Perception* (virtual).

Stuchlý, E., Ludwig, C., Malhotra, G. (2021). Not great, not terrible: A reward "landscape" analysis of time-varying decision thresholds. *Annual meeting Society for Mathematical Psychology* (virtual).

Garibbo, M., Ludwig, C., Lepora, N., & Aitchison, L. (2021). What can deep reinforcement learning tell us about human motor learning and vice-versa? *Neuromatch Conference 4* (virtual).

Stewart, E.E.M., Ludwig, C.J.H., Schütz, A.C. (2021). Humans retain a representation of information acquired across fixations. *TeaP* (Tagung Experimentell Arbeitender Psychologen; virtual).

Montero, M.L., Ponte-Costa, R., Bowers, J.S., Ludwig, C., Malhotra, G. (2020). Perceptual front-ends for decision-making. *Annual meeting Society for Mathematical Psychology* (virtual).

Stewart, E.E.M., Ludwig, C., Schütz, A.C. (2020). Humans are more confident for items they have fixated before. *Annual meeting Vision Sciences Society* (virtual).

Hadjipanayi, V., Kent, C., Ludwig, C. (2020). Eye movements during unequal attention splitting in a multiple object tracking task. *Meeting of the Experimental Psychology Society* (virtual).

Han, Q., Ludwig, C.J.H., Quadflieg, S. (2020). Decision Avoidance and Regret: A systematic review and meta-analysis. *Meeting of the Experimental Psychology Society*.

Blything, R. Vankov, I., Ludwig, C.J.H., & Bowers, J.S. (2019). *Conference on Cognitive Computational Neuroscience*.

Sullivan, B., Doughty, H., Mayol-Cuevas, W., Damen, D., Ludwig, C., & Gilchrist, I. (2019). Predicting self-rated uncertainty from eye movements in a natural task. *European Conference on Visual Perception*.

Blything, R. Vankov, I., Ludwig, C.J.H., & Bowers, J.S. (2019). Translation tolerance in vision. *Proceedings of the Cognitive Science Society*.

Ludwig, C.J.H., Trukenbrod, H.A., Engbert, R. (2019). Temporal control in modelling eye fixations. *European Conference on Eye Movements*.

Ludwig, C.J.H., Trukenbrod, H.A., Engbert, R. (2019). Temporal control in modelling eye fixations. *Annual meeting Society for Mathematical Psychology*.

Xiong, C., Ceja, C.R., Ludwig, C., & Franconeri, S. (2019). Attraction and response probe similarity effects in a multiple ensemble judgment task. *Annual meeting Vision Sciences Society*.

Sullivan, B., Doughty, H., Mayol-Cuevas, W., Damen, D., Ludwig, C., & Gilchrist, I. (2018). Detecting uncertainty while assembling a camping tent. *European Conference on Visual Perception*.

- Malhotra, G., Ludwig, C., & Gilchrist, I. (2017). Distinguishing between evidence accumulation and temporal probability summation in perceptual decision making. *European Conference on Visual Perception*.
- Ludwig, C., Alexander, N., Mundkur, I., & Redmill, D. (2017). The interaction of visual flow and perceptual load in the control of locomotion speed. *European Conference on Visual Perception*.
- Sullivan, B., Ludwig, C., Gilchrist, I., Damen, D., Mayol-Cuevas, W. (2017). Predicting eye and head coordination while looking and pointing. *European Conference on Visual Perception*.
- Malhotra, G., Ludwig, C., & Gilchrist, I. (2017). Distinguishing between evidence accumulation and temporal probability summation in perceptual decision making. *Annual meeting Society for Mathematical Psychology*.
- Ludwig, C.J.H., Stothart, G., Hedge, C., & Skinner, A. (2015). Control of fixation duration by foveal and peripheral evidence. *European Conference on Eye Movements*.
- Jarvstad, A., Ludwig, C.J.H., Bogacz, R., & Gilchrist, I.D. (2015). Expectation and saccade latency: Prior probability and number of alternatives. *European Conference on Eye Movements*.
- Megardon, G., Sumner, P., & Ludwig, C.J.H. (2015). Spatio-temporal stimuli interactions in visual-oculomotor pathway: Are they spatiotopic or retinotopic? *European Conference on Eye Movements*.
- Ludwig, C., & Evens, D. (2014). Information foraging for perceptual decisions. *Psychonomics Society's 55th Annual Meeting*.
- Malhotra, G., Leslie, D., Ludwig, C., & Bogacz, R. (2014). Changing decision criteria in rapid and slow decisions: Do people behave optimally? *Decision-Making Bristol*.
- Mason, A., Ludwig, C., Howard-Jones, P., & Farrell, S. (2014). Chance-based uncertainty of reward improves long-term memory. *Decision-Making Bristol*.
- Ludwig, C., & Evens, D. (2014). Information foraging for perceptual decisions. *Decision-Making Bristol*.
- Ludwig, C.J.H., Davies, J.R., & Eckstein, M.P. (2013). Parallel and independent foveal analysis and peripheral selection. *European Conference on Eye Movements*.
- Ludwig, C.J.H., Davies, J.R., & Eckstein, M.P. (2012). Parallel extraction of information for foveal analysis and peripheral selection of where to look next. *Annual meeting Vision Sciences Society*.
- Evens, D.R., Cassey, T., Marshall, J.A.R., Bogacz, R., & Ludwig, C.J.H. (2012). Active visual sampling in uncertain environments. *Annual meeting Vision Sciences Society*.
- Ludwig, C.J.H., Farrell, S., Ellis, L.A., Hardwicke, T.E., & Gilchrist, I.D. (2011). Context-selective belief-updating accounts for "noise" in accumulator models of saccadic choice and latency. *European Conference on Eye Movements*.
- Davies, J.R., & Ludwig, C.J.H. (2011). The eyes are driven by visual mechanisms that receive novel inputs across saccades. *European Conference on Eye Movements*.
- Evens, D.R., Cassey, T., Marshall, J.A.R., Bogacz, R., & Ludwig, C.J.H. (2011). Active visual sampling strategy adapts to environmental uncertainty. *European Conference on Eye Movements*.
- Cassey, T., Evens, D.R., Ludwig, C.J.H., Marshall, J.A.R., & Bogacz, R. (2011). Adaptive sampling of information during perceptual decision problems. *Annual meeting Society for Mathematical Psychology*.
- Davies, J.R., & Ludwig, C.J.H. (2011). Saccadic decisions in response to new objects in spatiotopic and retinotopic reference frames. *Annual meeting Vision Sciences Society*.
- Ludwig, C.J.H., & Davies, J.R. (2011). Estimating the growth of discriminative information guiding perceptual decisions. *Annual meeting Vision Sciences Society*.
- Etchells, P.J., Benton, C.P., Ludwig, C.J.H., & Gilchrist, I.D. (2010). Contrast effects on velocity integration for saccades to moving targets. *European Conference on Visual Perception*.
- Ludwig, C.J.H., & Farrell, S. (2010). Adaptation of oculomotor IOR to the environmental statistics through sequential updating of expectations. *European Conference on Visual Perception*.
- Ludwig, C.J.H., Farrell, S., Ellis, L.A., Hardwicke, T.E., & Gilchrist, I.D. (2010). Statistical learning facilitates adaptive eye movement decisions. *European Conference on Visual Perception*.
- Ludwig, C.J.H., Farrell, S., Ellis, L.A., & Gilchrist, I.D. (2009). Inhibition of saccadic return is sensitive to the probabilistic context. *European Conference on Eye Movements*.
- Evens, D.R., Gilchrist, I.D., & Ludwig, C.J.H. (2009). Anti-saccades do not benefit from attentional diversion. *European Conference on Eye Movements*.
- Ellis, L.A., Farrell, S., Ludwig, C.J.H., & Gilchrist, I.D. (2009). The modulation of inhibition of saccadic return by environmental statistics: Is there a role for predictive cues? *European Conference on Eye Movements*.

- Etchells, P.J., Benton, C.P., Ludwig, C.J.H., & Gilchrist, I.D. (2009). Estimation of temporal motion integration in saccades to moving targets. *European Conference on Eye Movements*.
- Ludwig, C.J.H., Farrell, S., Ellis, L.A., & Gilchrist, I.D. (2009). Inhibition of saccadic return is sensitive to the probabilistic structure of the environment. *Annual meeting Vision Sciences Society*.
- Etchells, P.J., Benton, C.P., Ludwig, C.J.H., & Gilchrist, I.D. (2009). Intercepting moving targets: Estimating motion integration and saccadic dead time. *Annual meeting Vision Sciences Society*.
- Ludwig, C.J.H. (2008). Modelling saccadic decision-making. *Applied Vision Association*.
- Etchells, P.J., Benton, C.P., Ludwig, C.J.H., & Gilchrist, I.D. (2008). Hitting a movement target: interaction between 'when' and 'where' in saccade programming. *European Conference on Visual Perception*.
- Rushton, S.K., & Ludwig, C.J.H. (2008). Capture of attention by scene-relative object movement during self-movement. *European Conference on Visual Perception*.
- Ludwig, C.J.H., Ranson, A., & Gilchrist, I.D. (2007). Comparison of the effect of dynamic visual events on saccade target selection. *European Conference on Eye Movements*.
- Ludwig, C.J.H., Ranson, A., Droulias, A., & Gilchrist, I.D. (2007). Limited temporal integration for saccade generation. *European Conference on Eye Movements*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2007). A sequential sampling model of saccadic double-steps in direction. *Annual meeting Vision Sciences Society*.
- Ludwig, C.J.H., Eckstein, M.P., & Beutter, B.R. (2006). Limited flexibility in the filter underlying saccadic targeting. *European Conference on Visual Perception*.
- Butler S.H., Ludwig C.J.H., Gilchrist I.D., Muir K., Bone I., Reeves I., Duncan G., & Harvey M. (2006). Evidence from converging paradigms for posterior cortical involvement in response inhibition. *European Conference of Visual Perception*.
- Harvey M., Butler S.H., Ludwig C.J.H., Muir K., Bone I., Reeves I., Duncan G., & Gilchrist I.D. (2006). Magnocellular impairment drives size distortion in hemispatial neglect. *European Conference on Visual Perception*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2005). Stimulus-driven and goal-driven contributions to capture. *AGM of the European Brain and Behaviour Society*.
- Butler S.H., Ludwig C.J.H., Gilchrist I.D., & Harvey M. (2005). Parietal lobe involvement in response inhibition. *AGM European Brain and Behaviour Society*.
- Ludwig, C.J.H., Gilchrist, I.D., McSorley, E., & Baddeley, R.J. (2005). The temporal impulse response underlying saccadic decisions. *European Conference on Eye Movements*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2005). Determinants of saccadic choice: Contrast response and task demands. *European Conference on Eye Movements*.
- Butler S., Ludwig C.J.H., Gilchrist I.D., Muir K., & Harvey M. (2005). Anti-saccades in patients with right parietal lesions. *European Conference on Eye Movements*.
- Ludwig, C.J.H., Gilchrist, I.D., McSorley, E., & Baddeley, R.J. (2005). Visual sampling and saccadic decisions. *Annual meeting Vision Sciences Society*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2005). On the mapping between saccade latency and visual processing time. *Applied Vision Association*.
- Ludwig, C.J.H., Gilchrist, I.D., & McSorley, E. (2004). The remote distractor effect in saccade programming: Channel interactions and lateral inhibition. *European Conference on Visual Perception*.
- Butler S.H., Ludwig C.J.H., Gilchrist I.D., & Harvey M. (2004). Oculomotor capture in a patient with a unilateral right temporo-parietal lesion. *European Conference of Visual Perception*.
- Ludwig, C.J.H., Gilchrist, I.D., & McSorley, E. (2004). The remote distractor effect in saccade programming: Channel interactions and lateral inhibition. *Annual meeting Vision Sciences Society*.
- Ludwig, C.J.H., Gilchrist, I.D., & McSorley, E. (2003). Spatial frequency tuning of the saccadic system. *European Conference on Eye Movements*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2003). Target similarity affects saccade curvature away from irrelevant onsets. *European Conference on Eye Movements*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2003). Target similarity affects saccade curvature away from irrelevant onsets. *Munich Visual Search Symposium*.
- Ludwig, C.J.H., & Gilchrist, I.D. (2002). Goal-driven modulation of oculomotor capture. *Annual meeting Cognitive Neuroscience Society*.

Peers, P., Ludwig, C., Rorden, C., Cusack, R., Driver, J., Bundesen, C., & Duncan, J. (2002). Using Bundesen's theory of visual attention to quantify attentional deficits following unilateral brain injury. *Annual meeting Cognitive Neuroscience Society*.

Ludwig, C.J.H., & Gilchrist, I.D. (2001). Stimulus-Driven and Goal-Driven Control over Saccade Target Selection. *European Conference on Eye Movements*.

Ludwig, C. J. H., & Gilchrist, I. D. (2001). Stimulus-driven and goal-driven control over visual selection. *Experimental Psychology Society meeting*.