



Dr Casimir Ludwig
M.A.(Nijmegen), Ph.D.(Bristol)

Reader

Area of research

Human vision, decision-making and action

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Summary

In my lab we study how visual information is used in the control of behaviour, as manifest in motor actions. In particular, I am interested in the decision processes that govern (i) how we actively sample information from the environment by shifting gaze, (ii) how the sampled information is used to draw inferences about the state of the environment, and (iii) how these inferences guide our motor behaviour. The methods I use include eye tracking, visual psychophysics, motion capture, virtual reality and computational modelling.

Current and Recent Grants

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, 100k.

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.

Biography

I studied psychology (and a bit of the cognitive science programme) at what is now known as the Radboud University Nijmegen (The Netherlands), eventually specialising in neuropsychology. I spent almost a year at the MRC-Cognition and Brain Sciences Unit, where I was fortunate enough to work with John Duncan on visual attentional control in neurological patients with a variety of brain lesions. It was this experience that got me excited about a research career. I stayed in the UK and obtained my PhD from the University of Bristol early 2003. I was a post-doctoral researcher for 5 years before being awarded a 5-year Advanced Research Fellowship from the UK Engineering and Physical Sciences Research Council. Towards the end of the fellowship I was offered a proleptic position at the University of Bristol, as a Reader in Experimental Psychology.

Teaching

Current teaching duties

Year 2 - Biological Psychology (Unit Coordinator).

MSc - Generic Research Skills (3 sessions).

MSc - Neuropsychological Analysis Tools (3 lectures + practical sessions).

Keywords

- Human Vision
- Eye Movements
- Motor Control
- Decision-making
- Modelling

Expertise

I am broadly interested in how motor systems deal with incoming sensory information to guide behaviour. My research to date has focused on the visual and oculomotor systems. We have recently acquired the capability of studying the role of vision in other motor behaviours (e.g. head movements, reaching and grasping, locomotion). The methods I use include eye tracking, motion capture, visual psychophysics, and computational modelling.

- models of perceptual/saccadic decision-making
- visual signals driving saccadic eye movements
- visual responses across saccades
- learning the statistics of the 'world'
- orienting behaviour during self-motion

Memberships

Organisations

[School of Experimental Psychology](#)

Other sites

- [Neuroscience](#)

Psychological Science staff

- [Psychological Science academic staff](#)

Research themes

- [Cognitive science](#)

Research groups

- [Cognitive science > Visual perception group](#)

Links

-  [Personal homepage](#)

Recent publications

- Jang, Y, Sullivan, BT, Ludwig, CJH, Gilchrist, ID, Damen, D & Mayol-Cuevas, WW, 2019, '[EPIC-Tent: An Egocentric Video Dataset for Camping Tent Assembly](#)'.
- Malhotra, G, Leslie, D, Ludwig, C & Rafal, B, 2018, '[Time-varying decision boundaries: insights from optimality analysis](#)'. *Psychonomic Bulletin and Review*, vol 25., pp. 971-996
- Ludwig, CJ, Howard, KL, Jedrzejewska, AA, Mundkur, I & Redmill, D, 2018, '[The influence of visual flow and perceptual load on locomotion speed](#)'. *Attention, Perception, and Psychophysics*, vol 80., pp. 69-81
- Mason, A, Farrell, S, Howard-Jones, P & Ludwig, C, 2017, '[The role of reward and reward uncertainty in episodic memory](#)'. *Journal of Memory and Language*, vol 96., pp. 62-77

- Malhotra, G, Leslie, D, Ludwig, C & Rafal, B, 2017, '[Overcoming Indecision by Changing the Decision Boundary](#)'. *Journal of Experimental Psychology: General*, vol 146., pp. 776-805
- Mason, A, Ludwig, C & Farrell, S, 2017, '[Adaptive scaling of reward in episodic memory: a replication study](#)'. *Quarterly Journal of Experimental Psychology*, vol 70., pp. 2306-2318
- Ludwig, CJH & Evens, DR, 2017, '[Information Foraging for Perceptual Decisions](#)'. *Journal of Experimental Psychology: Human Perception and Performance*, vol 43., pp. 245-264
- Megardon, G, Ludwig, C & Sumner, P, 2017, '[Trajectory curvature in saccade sequences: spatiotopic influences vs. residual motor activity](#)'. *Journal of Neurophysiology*, vol 118., pp. 1310-1320
- Bowers, JS, Vankov, I & Ludwig, CJH, 2016, '[The visual system supports on-line translation invariance for object identification](#)'. *Psychonomic Bulletin and Review*, vol 23., pp. 432-438
- Ludwig, CJH, Davies, JR & Eckstein, M, 2014, '[Foveal analysis and peripheral selection during active visual sampling](#)'. *Proceedings of the National Academy of Sciences of the United States of America*, vol 111., pp. E291-E299

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