Dr Roland Baddeley
Ph.D.(Stir.)

Reader

Area of research

Bayesian modelling; statistics of natural images

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Summary

The real world is fundamentally noisy and uncertain. Dealing with this uncertainty is one of the most diffuclt things animals do. Over the last 200 years Bayesian techniques have been developed to deal with such uncertainty, and the development of computers has great expanded what problems can be approached.

I am interested in applying such techniques to understanding human and animal cognition. As long as reasonably large data sets can be gathered, insight can be gained into most problems, but at the moment I am interested in visual development, eposodic and semantic memory (and forgetting), eye movements, and signalling in animals.

Recent and current grants

- Roland Baddeley £ 33,000 (1998) MRC One year case award: optimal motor adaptation to a changing world.
- Daniel Osorio and Roland Baddeley (2000-2003) BBSRC £178,000 The analysis of signalling in cuttlefish.
- Roland Baddeley and Daniel Osorio (1999-2002) EPSRC £168,000Illumination invariance and the natural statistics of the world
- Roland Baddeley (2004-2007) £170,000 EPSRC Reverse Engineering of Vertebrate Brain, Supported by EPSRC grant EP/C516303/1

Biography

My first degree was in Artificial Intelligence and Computer Science from Sussex, and after various computer related jobs in the industry, I did a PhD with Roger Watt at Stirling University on statistical models of early vision. After post-docs in Cambridge Physiology department (with Horace Barlow), and Oxford Psychology and Physiology, I got a lectureship in Experimental Psychology at the University of Sussex. I moved at the end of 2003 to Bristol.

Teaching

Experimental Psychology:

- Advanced Statistics II

I teach on the 2nd year course Advanced Statistics, the third year option Computer Models in Psychology, the third year option Computational Neuroscience, and the Masters level course Psychological Statistics. I am the organiser of the Research Methods MSc and Masters course. organiser.

PhD students supervised and co-supervised

- Ben Vincent (2001-2004).
- Townshend JM (1999-2002)

- John Fennell
- Joanna Hall
- Scott Watkins

Keywords

- Bayesian inference

Expertise

My first degree was in Artificial Intelligence and Computer Science from Sussex, and after various computer related jobs in industry, I did a PhD with Roger Watt at Stirling University on statistical models of early vision. After post-docs in Cambridge Physiology dept (with Horace Barlow), and Oxford Psychology and Physiology, I got a lectureship in Experimental Psychology at the University of Sussex. I moved at the end of 2003 to Bristol. My research interests include; animal communication, Bayesian modelling, computer models in psychology, statistics of natural images, eye movements, memory and forgetting and motor learning. I teach on the 2nd year course advanced statistics, the third year option Computer models in Psychology, the third year option Computational Neuroscience, and the Masters level course Psychological Statistics. I am organiser of the Research Methods MSc and Masters course organiser.

- animal communication
- Bayesian modelling
- computer models in psychology
- statistics of natural images
- eye movements
- memory
- forgetting

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

- home page

Recent publications

- Fennell, J, Talas, L, Baddeley, R, Cuthill, I & Scott-Samuel, N, 2019, 'Optimizing colour for camouflage and visibility using deep learning: the effects of the environment and the observer's visual system'. *Journal of the Royal Society Interface*, vol 16., pp. 20190183
- Talas, L, Fennell, J, Kjernsmo, K, Cuthill, I, Scott-Samuel, N & Baddeley, R, 2019, 'CamoGAN: Evolving optimum camouflage with Generative Adversarial Networks'. *Methods in Ecology and Evolution*.
- Metzler-Baddeley, C, Mole, JP, Sims, R, Fasano, F, Evans, J, Jones, DK, Aggleton, JP & Baddeley, RJ, 2019, 'Author Correction: Fornix white matter glia damage causes hippocampal gray matter damage during age-dependent limbic decline (Scientific Reports, (2019), 9, 1, (1060), 10.1038/s41598-018-37658-5)'. *Scientific Reports*, vol 9.
- Baddeley, RJ, Franks, NR & Hunt, ER, 2019, 'Optimal foraging and the information theory of gambling'. *Journal of the Royal Society Interface*, vol 16.
- Metzler-Baddeley, C, Mole, JP, Sims, R, Fasano, F, Evans, J, Jones, DK, Aggleton, JP & Baddeley, RJ, 2019, 'Fornix white matter glia damage causes hippocampal gray matter damage during age-dependent limbic decline'. *Scientific Reports*, vol 9.
- Metzler-Baddeley, C, Mole, JP, Leonaviciute, E, Sims, R, Kidd, EJ, Ertefai, B, Kelso-Mitchell, A, Gidney, F, Fasano, F, Evans, J, Jones, DK & Baddeley, RJ, 2019, 'Sex-specific effects of central adiposity and inflammatory markers on limbic microstructure'. *NeuroImage*, vol 189., pp. 793-803

- Volonakis, T, Matthews, O, Liggins, E, Baddeley, R, Scott-Samuel, N & Cuthill, I, 2018, 'Camouflage assessment: Machine and human'. *Computers in Industry*, vol 99., pp. 173-182
- Hunt, ER, Franks, NR & Baddeley, RJ, 2018, 'The Bayesian Superorganism I: collective probability estimation'. *bioRxiv*.
- Zhang, F, Moss, FM, Baddeley, R & Bull, DR, 2018, 'BVI-HD: A Video Quality Database for HEVC Compressed and Texture Synthesised Content'. *IEEE Transactions on Multimedia*.
- Hunt, ER, Franks, NR & Baddeley, RJ, 2018, 'The Bayesian Superorganism III: externalised memories facilitate distributed sampling'. *bioRxiv*.

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