

Curriculum Vitae

Nicholas Price

AMusA, BEng (Hons), BSc (Hons)

Contact details

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Summary of Research Interests

My research has focussed on electrophysiological investigations of the temporal dynamics of motion processing in macaque area MT, the nucleus of the optic tract in the wallaby and feline cortical area 17, 18 and PMLS. I have studied how the responses of individual neurons adapt with prolonged exposure to motion and what happens following the cessation of motion. I am actively studying how the responses of individual neurons and the resulting population code can provide information about continually changing stimuli such as those with steadily changing contrast or speed. More recently I have investigated the latencies and direction tuning of neurons in area MT stimulated with active and passive motion.

Education and Qualifications

- 2002-2005 Enrolled in Neuroscience Graduate Program at Australian National University (ANU).
- 2001 Bachelor of Engineering (Electronics Major) with First Class Honours from University of Western Australia (UWA)
- 2000 Bachelor of Science (Neuroscience) with First Class Honours and University Medal from ANU
- 1996-1999 Bachelor of Science (Physiology / Neuroscience Major) from UWA
- 1996 Associate in Music in Piano of the Australian Music Examinations Board

Scientific Employment and Work Experience

- 2003-2004 Visiting Graduate Student at Visual Sciences Group, Yerkes National Primate Center, Emory University, Atlanta, GA
- 2004 Demonstrator in ANU Psychology Department
- 2001 Tutor and Demonstrator in UWA Engineering Department
- 2000 Research assistant in Developmental Neurobiology, RSBS, ANU
- 1999 Summer Scholar in Centre for Visual Sciences, RSBS, ANU

School and General Education

- US Graduate Recruitment Exam scores: Quantitative 2nd percentile (score 800/800); Verbal 9th percentile (score 640/800); Analytical 1st percentile (score 800/800)
- Year 12 leaving exams TEE score: 494.8 out of 510 (1st Percentile)
- Dux of School (Proxime Accessit) (1995)
- Headmaster's Prize for Best All Round Student in Years 11 & 12 (1995)
- Dux of Year 11 (aeq.) (1994)

Publications – Refereed Journals

1. Crowder NA, Price NSC, Hietanen MA, Dreher B, Clifford CWG, Ibbotson MR (2005) Relationship between contrast adaptation and orientation tuning in V1 and V2 of cat visual cortex. *Journal of Neurophysiology*, accepted Sep 28
2. Price NSC, Crowder NA, Hietanen MA, Ibbotson MR (2005) Neurons in V1, V2 and PMLS of cat cortex are speed tuned but not accelerated tuned: the influence of motion adaptation. *Journal of Neurophysiology*, accepted Sep 21
3. Price NSC, Ono S, Mustari MJ, Ibbotson MR (2005) Comparing acceleration and speed tuning in macaque MT: physiology and modeling. *Journal of Neurophysiology*, accepted Aug 3
4. Price NSC, Ibbotson MR, Ono S & Mustari MJ (2005) Rapid processing of retinal slip during saccades in macaque area MT. *Journal of Neurophysiology* 94(1): 235-46
5. Ibbotson MR, Price NSC & Crowder NA (2005) On the division of cortical cells into simple and complex types: a comparative viewpoint. *Journal of Neurophysiology* 93(6): 3699-702
6. Ibbotson MR, Price NSC, Das VE, Hietanen MA, Mustari MJ (2005) Torsional eye movements during psychophysical testing with rotational patterns. *Experimental Brain Research*. 160(2): 264-7
7. Price NSC, Greenwood JA & Ibbotson MR (2004) Spatiotemporal tuning of Phantom Motion Aftereffects. *Vision Research*. 44(17): 1971-79
8. Price NSC & Ibbotson MR (2002) Direction-selective neurons in the optokinetic system with long lasting after-responses. *Journal of Neurophysiology* 88(5): 2224-31
9. Ibbotson MR and Price NSC (2001) Spatiotemporal tuning of directional neurons in mammalian and avian pretectum: a comparison of physiological properties. *Journal of Neurophysiology* 86(5): 2621-4.
10. Price NSC & Ibbotson MR (2001) Pretectal neurons responding to slow wide-field retinal motion: could they compensate for slow drift during fixation. *Clinical and Experimental Ophthalmology* 29(3): 201-205
11. Price NSC & Ibbotson MR (2001) Pretectal neurons optimized for the detection of saccade-like movements of the visual image. *Journal of Neurophysiology* 85(4): 1512-1521

Theses

- ANU Neuroscience PhD Thesis (submitted, Sep 2005)
Supervisor: Michael Ibbotson. Advisors: Mark Edwards, Mandyam Srinivasan.
- UWA Engineering Honours Thesis (2001) Image Reconstruction in Optical Coherence Tomography: An investigation of coherent deconvolution.
Supervisors: D Sampson and E Smith. Examiners: D Sampson and V Sreeram
- ANU Neuroscience Honours Thesis (2000) Wide-field motion sensitive neurons in the pretectum of the wallaby (*Macropus eugenii*): Physiological responses and computer

simulations.

Supervisor: Michael Ibbotson. Examiners: WR Levick and R Taylor

Abstracts and Conference Proceedings

- Price NSC, Ono, S, Mustari, MJ & Ibbotson MR (2005) Motion is processed faster during saccades in macaque area MT. Australian Neuroscience Society Meeting (Perth)
- Ibbotson MR, Price NSC, Ono S & Mustari, MJ (2005) Acceleration and speed sensitivity in area MT. Australian Neuroscience Society Meeting (Perth)
- Crowder NA, Price NSC, Hietanen MA, Dreher B, Clifford CWG & Ibbotson MR (2005) Dependence of contrast adaptation on firing rate and adapting direction in V1 and V2 of cat visual cortex. Australian Neuroscience Society Meeting (Perth)
- Price NSC, Ono, S, Mustari, MJ & Ibbotson MR (2004) Rapid processing of retinal slip during saccades in macaque area MT. Society for Neuroscience (San Diego) Poster 301.3
- Ibbotson MR, Price NSC, Ono S & Mustari, MJ (2004) Acceleration and speed sensitivity in area MT. Society for Neuroscience (San Diego) Poster 301.1
- Crowder NA, Price NSC, Hietanen MA, Dreher B, Clifford CWG & Ibbotson MR (2004) Contrast adaptation in V1 and V2 of cat visual cortex. Society for Neuroscience (San Diego) Poster 410.14
- Price NSC, Ono, S, Mustari, MJ & Ibbotson MR (2004) Direction tuning is not straightforward. Australian Neuroscience Society Meeting, Melbourne.
- Ibbotson MR, Price NSC & Clifford CWG (2003) Acceleration sensitivity and habituation in PMLS neurons. Vision Sciences Society Meeting, Sarasota.
- Price NSC & Ibbotson MR (2003) Phantom Aftereffects: distinguishing local and global motion. Vision Sciences Society Meeting, Sarasota.
- Price NSC, Clifford CWG & Ibbotson MR (2003) PMLS neurons are sensitive to velocity changes. Australian Neuroscience Society Meeting, Adelaide.
- Price NSC, Greenwood JA & Ibbotson MR (2002) Motion that isn't there. Australian Ophthalmic and Vision Science Meeting, Sydney.
- Price NSC & Ibbotson MR (2000) Non-directional pretectal neurons: could they modulate perception and suppress ocular following during saccades? Australian Ophthalmic and Vision Science Meeting, Sydney.
- Ibbotson MR & Price NSC (2000) Do neurons in the pretectum control slow drift during fixation? Australian Ophthalmic and Vision Science Meeting, Sydney.
- James, A.C., Maddess, T. & Price NSC (2000). Dichoptic kernels from short binary and ternary sequences. The 34th ISCEV Symposium, 34, 105. Sydney.
- James, A.C., Maddess, T., Price NSC & Ye, N. (2000). Dichoptic multiregion VEP kernels from short binary and ternary sequences. Invest. Ophthalm. Vis. Sci., 41, S490.

Invited Talks

- 2004 Center for Visual Sciences, Research School of Biological Sciences,
Australian National University, Canberra, Australia
- 2003 Visual Sciences, Yerkes National Primate Center,
Emory University, Atlanta, Georgia, USA
- 2001 Center for Visual Sciences, Research School of Biological Sciences,
Australian National University, Canberra, Australia

Scholarships and Grants

- Australian Postgraduate Award \$18000 per annum (2002-2005)
- ANU Vice-Chancellors Award \$5000 per annum (2002-2005)

Last updated: Oct 2005

- National Institute of Biosciences Travel Grant \$1000 (2003)
- ANU Honours Scholarship \$9000 (2000)
- Sangora Educational Foundation Travel Grant \$10000 (1996)
- RW Ritchie Scholarship at Wesley College \$3000 per annum (1991-1995)

Prizes

- Istvan Tork Prize for best student oral presentation at the Australian Neuroscience Society meeting (2004)
- Institution of Electrical Engineers Prize for highest Engineering Honours Thesis Mark, UWA (2002)
- Adept Electronic Solutions Computer Vision 412 Prize, UWA (2001)
- The University Medal in Neuroscience from ANU (2000)
- Fenner Hall Award for Excellence (2000)
- Gledden Tour participant: international engineering tour offered to the top 20 UWA engineering students (1999)
- UWA Physiology Prize (1998)
- Participant in Telecom Mathematical School of Excellence for selection of Australian Mathematical Olympiad team (1993)

Experience and Skills

Proficient in:

Matlab for data analysis, stimulus presentation with the VSG and data acquisition
Visual Basic for stimulus presentation with the VSG
VSG (Cambridge Research Systems Visual Stimulus Generator) controls
Spike2 scripting language for data acquisition
MS Windows and Office Package

Familiar with Unix / Linux operating system.

Experienced in interacting with, training and electrophysiological testing of awake behaving primates.

Experienced in surgery, life support systems and electrophysiological testing of anaesthetised, paralysed cats and wallabies.

Professional Affiliations

- Society for Neuroscience
- Australian Neuroscience Society
- National Institute of Biosciences (Australia) 2002-2005
- National Institute of Health and Human Sciences (Australia) 2002-2005
- Institute of Electrical Engineers (UK) 2003-2005

Positions held

- Student representative on Faculty Board, Research School of Biological Sciences (2003-2005)
- Treasurer of Circaholics: The ANU Juggling Club (2004)
- Committee Member of Australian Unicycling Society (2000-2001)
- UWA Juggling Club: President (1998-99, 2001); Secretary (1997)

Referees

1.
Dr Michael R Ibbotson
Visual Sciences
Research School of Biological Sciences
Australian National University
Canberra, ACT, AUSTRALIA 2602
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2.
Dr Michael J Mustari
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Yerkes National Primate Center
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Dr Colin WG Clifford
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