

## **APOORVA BHANDARI**

*CLPS, Brown University, 190 Thayer St., Providence, RI 02912*

E-mail: [apoorva\\_bhandari@brown.edu](mailto:apoorva_bhandari@brown.edu)

### **Employment**

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- Sep. 2013 – present    **Post-doctoral Research Associate**  
Badre Lab., CLPS, Brown University, Providence, RI, USA.
- Mar. – Jun. 2013      **Post-doctoral Research Assistant**  
Stokes Lab., OHBA, Dept. of Psychiatry, Oxford University, Oxford, UK.
- 2005 – 2007          **Senior Educational Specialist and Manager**  
Educational Initiatives Ltd., Ahmedabad, India.

### **Education**

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- 2008 – 2013          **MRC Cognition and Brain Sciences Unit, University of Cambridge**  
PhD in Cognitive Neuroscience  
Advisors: John Duncan, Russell Thompson  
Thesis title: Task Representations in Fronto-parietal cortex
- 2007 – 2008          **School of Biomedical Sciences, University of Edinburgh**  
M.Sc. Research in Neuroscience (First)  
Advisors: Emma Wood, Paul Dudchenko  
Thesis title: Visual landmark control of spatial behaviour: Role of post-subiculum
- 2004 – 2005          **National Centre for Biological Sciences, TIFR, India**  
Coursework and research rotations as part of post-graduate training programme  
Advisors: Upinder Bhalla, GV Shivashankar, Satyajit Mayor
- 2000 – 2003          **St. Xavier's College, Gujarat University, India**  
B.Sc. in Biochemistry and Vocational Biotechnology (First)

### **Awards**

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- 2008 – 2012          Gates Cambridge Scholarship (\$150,000). University of Cambridge, UK.
- 2008 – 2011          Overseas Research Scholarship (\$50,000). University of Cambridge, UK.
- 2004 – 2005          Junior Research Scholarship for post-graduate study at the National Centre for Biological Sciences, India. (1% acceptance)
- 1999 – 2000          Bhadra Doshi & Bharat Bhatt award, St. Xavier's High School, Ahmedabad, India.

### **Professional Associations**

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Cognitive Neuroscience Society, Society for Neuroscience

## Publications

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**Bhandari, A.,** Duncan, J. (2014) Goal neglect and knowledge chunking in the construction of novel behavior. *Cognition*, 130(1), 11-30.

**Bhandari, A.,** Duncan, J. Task demands drive coding of task-relevant information within fronto-parietal cortex. (in preparation).

Rajagopalan, S., Sankar, V., **Bhandari, A.** et. al. Student Learning in Metros 2006: Study Report (online), *Section 2.1: 17-20, Educational Initiatives.*

## Poster Presentations

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**Bhandari, A.,** Sigala, N., Stokes, M., Gaffan, D., Duncan, J. Prefrontal activity rapidly adapts to code task-role of novel objects.. Poster presentation at the Annual Society for Neuroscience Meeting, San Diego, CA, USA, November, 2013.

**Bhandari, A.,** Duncan, J. Effects of task demands on task relevant coding in MD regions. Poster presentation at the 19<sup>th</sup> Annual Cognitive Neuroscience Society meeting, Chicago, IL, USA, March 2012.

**Bhandari, A.,** Srinivasa, S., Bagadia, M., Gupta, A. Mining information from tutor data to improve pedagogical content knowledge. Poster presentation at the 3<sup>rd</sup> International Conference on Educational Data Mining, Pittsburgh, PA, USA, June 2010.

**Bhandari, A.,** Dudchenko, P., Wood, E.. Developing a landmark-based spatial navigation task. Poster presentation at the Annual Edinburgh Neuroscience meeting, Edinburgh, UK, March 2008.

## Research Experience (Biology)

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Learning Complex Task-structure through exploration. (Post-doctoral work with David Badre at Brown University)

Employing novel behavioural methods and computational modeling to understand the mechanisms by which the structure of complex novel tasks is learnt in humans.

Task Representations in Fronto-parietal cortex. (PhD work with John Duncan at Cambridge University)

Employed both behavioral methods and multi-voxel pattern analysis of fMRI data in humans. Investigated the properties of task representations and the coding of task-relevant information in fronto-parietal regions of the brain.

Landmark control of spatial behaviour: role of the post-subiculum (MSc work with Emma Wood at the University of Edinburgh)

Trained rats on a novel localization task and used pharmacological lesions to test the hypothesis that synapses in the post-subiculum store the association between visual landmark information and spatial orientation signals.

Nanoscale Atomic Force Microscopic characterization of living cell membranes. (Rotation Project with G.V. Shivshankar and Satyajit Mayor at NCBS, Bangalore)

Conducted a nanoscale study of the cell membrane structures using Atomic Force Microscopy (AFM) on living cells in culture. Characterized conditions in which AFM techniques can be used for studying soft matter like cell surfaces, and made measurements of the size of putative membrane compartments.

A computational study of the role of Scaffold Proteins in MAP Kinase pathway dynamics in neuronal spines. (Rotation Project with Dr. Upinder Bhalla at the Computational Neuroscience Laboratory, National Centre for Biological Sciences, Bangalore.)

Built a realistic computational model of the MAP Kinase pathway in neuronal spines to test the hypothesis that Scaffold Proteins like KSR provide noise attenuation in the low molecular number regime of neuronal spines.

### **Educational Research Projects**

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Understanding student misconceptions through group interviews – study funded by a Wipro Applying Thought in Schools (WATIS) grant.

Led a systematic, large-scale research study of Indian school children's knowledge to determine the status, development and causes of children's misconceptions and alternate ideas regarding 15 key concepts in mathematics and science. I developed and piloted the interview methodology for the study, collected interview data from 90 classrooms, and was part of the expert team that analyzed video footage.

Student Learning in Metros – study funded by a Wipro Applying Thought in Schools (WATIS) grant.

Collaborated in a large-scale assessment study of school children's learning levels in the most popular schools in India's metropolitan cities. I was part of the team that developed the test instruments and conducted the analysis of the data. My contribution was to develop a special cognitive diagnosis instrument to assess how children's understanding of a concept develops across grades and to analyse the results of this study. The findings of the study were published as a special report and widely disseminated among schools and the government.

### **Teaching Experience**

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| 2010 – 2011 | Supervisor for Department of Experimental Psychology: Medical and Veterinary Sciences Tripos at the University of Cambridge.                         |
| 2009 – 2010 | Supervisor for Department of Experimental Psychology: Natural Sciences Tripos at the University of Cambridge.  |
| 2005 – 2007 | Guest Lecturer for Developmental Biology course at the Department of Biochemistry, Maharaja Sarajevo University, India.                              |
| 2005 – 2007 | Senior Teacher Trainer for Educational Initiatives plc. Designed training material and conducted over 20 teacher training workshops.                 |
| Summer 2003 | Guest Instructor at St. Xavier's College, Ahmedabad. Designed and delivered a course on 'Evolution by Natural Selection' for undergraduate students. |