

Sarah R. Allred

Curriculum Vitae

Contact Information

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Current Position

2006 - present, Postdoctoral Researcher. Computational, psychophysical and physiological studies of visual perception, specifically lightness and color perception. University of Pennsylvania, Lab of David Brainard.

Education

2006, Ph.D. Neurobiology and Behavior, University of Washington. Dissertation: *The neural basis of visual object perception*. Lab of Bharathi Jagadeesh.

1999, B.S. Applied Physics: Neuroscience Emphasis, Minors: Mathematics, Philosophy, Brigham Young University.

Publications

1. **Allred, S.R.**, Brainard, D.H. (*submitted to JOSA*). Contrast, constancy, and measurements of perceived lightness under parametric manipulation of surface slant and surface reflectance.
2. **Allred, S. R.**, Jagadeesh, B. (2007). Quantitative comparison between neural response in macaque inferotemporal cortex and behavioral discrimination of photographic images. *Journal of Neurophysiology*, doi:10.1152/jn.00016.2007.
3. **Allred, S.R.**, Liu, Y., and Jagadeesh, B. (2005). Selectivity of inferior temporal neurons for realistic pictures predicted by algorithms for image database navigation. *Journal of Neurophysiology*, doi:10.1152/jn.00130.2005.

Teaching Experience

Spring 2008, Instructor, Perception (Psychology 111). University of Pennsylvania.
2003, Co-Instructor, Seminar in Psychophysics (Psychology 551), University of Washington.
2001, Teaching Assistant, Vision (Physiology/Psychology 424), University of Washington.
1998-99, Teaching Assistant, Electricity and Magnetism (Physics 122), Brigham Young University.
1997-1998. Grader for Electricity and Magnetism (Physics 122). Brigham Young University
1997, TA Lab, Mechanics, Electricity and Magnetism, Thermodynamics, Waves (Physics 121, 122, 221). Brigham Young University.

Conference Presentations

1. **Allred, S. R.**, Lohnas, L. J., and Brainard, D. H. (2008). Bayesian model of lightness perception. GRC conference on sensory coding and the natural environment, July 28-Aug 1, 2008, Italy.
2. **Allred, S. R.**, Lohnas, L. J., and Brainard, D. H. (2008). Bayesian model of the staircase Gelb effect [Abstract]. *Journal of Vision*, 8(6):283, 283a, <http://journalofvision.org/8/6/283/>, doi:10.1167/8.6.283.

3. **Allred, S. R.** and Brainard, D. H. (2007). Scene complexity affects lightness constancy with respect to changes in object slant and surround reflectance. OSA Fall Vision Meeting, Sept 16-19, Berkeley, CA.
4. **Allred, S.R.** and Brainard, D. H. (2007). Parametric measurements of lightness in the context of real illuminated objects [Abstract]. *Journal of Vision*, 7(9):234a, <http://journalofvision.org/7/9/234/>, doi:10.1167/7.9.234.
5. **Allred, S.R.** and Jagadeesh, B. (2005). Selectivity of inferotemporal neurons for realistic images predicts behavioral choice. Program No. 362.7. 2005 Abstract Viewer. Washington, DC: Society for Neuroscience.
6. **Allred, S.R.** and Jagadeesh, B. (2004). Discrimination performance with realistic images is correlated with selectivity of macaque inferior temporal (IT) neurons. Program No. 751.10. 2004 Abstract Viewer. Washington, DC: Society for Neuroscience.
7. Liu, Y., **Allred, S.R.**, and Jagadeesh, B. (2004). Dynamics of target selection in stimulus arrays by inferotemporal (IT) neurons during presentation of static choice stimuli. Program No. 751.9. 2004 Abstract Viewer. Washington, DC: Society for Neuroscience.
8. **Allred, S.R.**, Liu, Y. and Jagadeesh, B. (2004). Algorithms for image database navigation and tuning of object selective neurons in the non-human primate. In Proceedings of the ACM SIGGRAPH Symposium on Applied Perception in Graphics and Visualization, Los Angeles, CA, August 7-8, 2004.
9. **Allred, S.R.**, Thompson, J. Y. S., and Jagadeesh, B. (2003). Color-based estimates of stimulus similarity predict perceptual similarity of image pairs to monkeys. *Journal of Vision*, 3(9), 511a, <http://journalofvision.org/3/9/511/>, doi:10.1167/3.9.511.
10. **Allred, S.R.**, Erickson, C. A. and Jagadeesh, B. (2002). Characteristics of pictures that evoke equivalent neural responses in macaque perirhinal cortex. Program No. 160.8. 2002 Abstract Viewer. Washington, DC: Society for Neuroscience.
11. Chien, S. H. L. **Allred, S.R.**, Teller, D. Y., and Palmer, J. (2000). Young infants' perception of surface lightness. The XX Annual Meeting of Optical Society of America (OSA): Color and Vision Division. Providence, Rhode Island.

Teaching Interests

Sensation and Perception

Behavioral Neuroscience

Cognitive Neuroscience

Computational Neuroscience

Physiological Psychology

Vision Science

Statistics and Methods

Experimental Psychology

Students Supervised

Fall 2008, Li Jiang, graduation rotation in neuroscience, psychophysics and modeling

Summer 2008, Vanessa Troiani, graduate rotation in neuroscience, HDR psychophysics.

Fall 2007, Lynn Lohnas, graduate rotation in neuroscience, Bayesian modeling.

Summer 2007, David Harwood, undergraduate summer intern, psychophysics.

Invited Talks

- 2008 Invited Lecturer, IRCS Undergraduate Summer Workshop in Cognitive Science and Cognitive Neuroscience.
- 2007, Rutgers University – Newark, *Contrast, constancy and perceived lightness*
- 2007, Brigham Young University, Psychology Colloquium, *Visual Perception*
- 2007, University of Pennsylvania, Penn Vision Seminar, *Perception and the Visual World*
- 2004, University of Washington, Neurobiology and Behavior Retreat, *Perceptual Similarity and Neural Selectivity in Extrastriate Visual Cortex*

Honors and Awards

- Vision Training Grant. NEI-UW. Tuition and stipend, 2001-2004.
- ARCS Graduate Fellowship. Seattle, WA. (University of Washington) 1999-2001.
- Department of Physics Dean's List. BYU. 1996-1999.
- Howard W. Hunter Presidential Scholar, Brigham Young University. Tuition and stipend (1995-99).
- IBM Thomas J. Watson Scholarship (1995-1999).
- National Merit Semi-Finalist (1995)

Other Experience

- 2009. Co-organizer, with Gary Hatfield (Penn, philosophy), *IRCS interdisciplinary workshop on cognitive and developmental factors in perceptual constancy*
- 2003 Edmonds Community College, Expanding Your Horizons. Career program for inner-city high school students.
- 2002-2003. Organizing committee, "What to do with a PhD in the Biological Sciences" student-run seminar series.
- 2002-3 Mentor, Seattle Girl's School. Private middle school for inner-city girls focused on math and science.
- 2002. Short course in computational neurobiology: vision at Cold Spring Harbor Laboratories.
- 2000. Graduate rotation: infant lightness perception with Davida Teller, University of Washington.
- 1999. Graduate rotation: computational vision with Michael Shadlen, University of Washington.
- 1997-1999. Undergrad research: neuroendocrinology with George Bloch, Brigham Young University.
- 1998. Undergrad research: thin films and x-ray diffraction with Steven Turley, Brigham Young University.
- 1998. Data analyst. Western Wats Company.

Memberships (Past and Present)

- Society for Neuroscience
- ACM
- Vision Sciences Society

Ad-Hoc Reviewer

- Vision Research
- Developmental Science
- Cengage Learning (textbook review)
- Philosophical Psychology

References

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Gary Hatfield, PhD
Adam Seybert Professor in Moral and Intellectual Philosophy
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