

Jude Francis Mitchell, Ph.D.

Curriculum Vitae

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Education

- 1996-2002** University of California at San Diego, Department of Cognitive Science
San Diego, CA
Ph.D., Cognitive Science
- 1990-1994** Harvard University
Cambridge, MA
B.S., Electrical Engineering

Awards and Support

- 2015-2018 U01-NS094330 "Neural ensembles underlying natural tracking."
Jude Mitchell, Co-I, Nicholas Priebe and Alex Huk, co-PI, Total: \$253,000.
- 2016-2017 Kavli Foundation Fellowship (Chinese-American Symposiums)
- 2016-2018 NHMRC (Australia) APP1083152 "Neural circuits for active vision in primate cerebral cortex". CIA, Marcello Rosa, CIB, Jude Mitchell
(no funds allowed outside Australia)
- 2014-2016 R21MH104756-01 "Optogenetic tools to distinguish neuronal class in behaving non-human primates." Jude Mitchell, PI, Cory Miller, co-PI. Total: \$275,000.
- 2012-2013 Kavli Institute Innovative Research Grant, Lead-PI, \$30,000
Developing marmosets as a model for visual neuroscience,
with an eye towards primate optogenetics.
- 2010-2012 Swartz Foundation Grant, Fellowship Recipient, \$55,000
Normalization Circuits and Spiking Models of Attention
- 2003-2005 NIH Training Fellowship in Cognitive Neuroscience, UCSD
Neuronal Mechanisms of Spatial Attention in the Macaque
- 1996-1999 NSF Graduate Student Fellowship, UCSD
Neuronal Models of Saccade Planning and Spatial Working Memory

Patent

Patent No. 61/727,599. *Electrode and method of use*. Filed November 17, 2013.

Research Experience

- 2015-present Assistant Professor, Brain and Cognitive Sciences
The University of Rochester, NY
Active vision and selective attention in the marmoset
- 2014-2015 NIH R21 research grant, Staff Scientist
Collaborating with Ed Callaway at the Salk Institute and Cory Miller at UCSD.
Development of optogenetics in the marmoset to study visual processing
- 2012-2013 Kavli Innovations Grant, Staff Scientist, The Salk Institute and UCSD
Collaborating with Dr. Cory Miller, Psychology Dept., UCSD
The marmoset as a model for visual neuroscience
- 2010-2011 Staff Scientist, The Salk Institute for Biological Studies
Computational models of selective attention
- 2007-2010 Senior Research Associate, The Salk Institute for Biological Studies
Neural mechanisms of spatial attention in behaving primates
- 2002 - 2007 Post-doctoral training at the Salk Institute with John Reynolds
Collaborating with Gene Stoner, Salk Institute, and with Steve Hillyard, UCSD
Object-based attention in visual psychophysics and ERP
- 1996 - 2002 Doctoral Thesis at UCSD with David Zipser
Neural network modeling of target selection and saccade planning
- 1994 - 1995 Analysis of semi-periodic signals in noisy time-series
Brigham Women's Hospital, Richard Kronauer and Emery Brown
- 1992 - 1994 Multi-compartment models of single neurons
Electrical Engineering Dept, Harvard University, Richard Kronauer

Teaching Experience

- 2016 Course Instructor Brain & Cognitive Sciences, U. of Rochester
BCS 203, Laboratory in Neurobiology
- 2015 Course Instructor Brain & Cognitive Sciences, U. of Rochester
Senior Seminar in Neuroscience
- 2002 Course Instructor Cognitive Science Dept, UCSD
Neural networks and models of cognition
- 2000 Course Instructor Cognitive Science Dept, UCSD
Introduction to probability and statistics

Consulting Experience

- 2011 Brain Corporation, Inc., Eugene Izhikevich San Diego, CA
Consulting for the development of biologically realistic models of vision.

Academic Service

- 2016 – present Executive committee, Center for Visual Science, University of Rochester
2016 – 2017 Boynton Series Colloquium Organizer
2015 – present IACUC committee, University of Rochester

Meetings and Symposia Organized

- November 14, 2016 The Marmoset Social, Society for Neuroscience, San Diego, CA
Organizers: Julio Martinez, Jude Mitchell, and John Reynolds
- June 2-5, 2016 The Future of Vision Attention. Rochester, NY
Bi-annual Center for Visual Science (CVS) symposium.
Organizers: Ben Hayden and Jude Mitchell
- October 18, 2015 The Marmoset Social, Society for Neuroscience, Chicago, IL
Organizers: Afonso Silva and Jude Mitchell
- Sept. 16-18, 2015 Comparative Neural Circuitry. Jackson Hole, WY
Organizers: Jude Mitchell, David Leopold, and Cory Miller

Invited Presentations

- 07/2015 – Neuroscience Seminar, University of Western Ontario, Canada
- *Active vision in marmosets: a model for visual neuroscience.*
- 06/2015 – The Common Marmoset as a Transgenic Model of the Human Brain in Health, Janelia Farm, Washington, DC.
- *Active vision in marmosets: a model for visual neuroscience.*
- 01/2015 – Japanese Meeting on Marmoset Neuroscience, Inuyama, Japan
- *Active vision in marmosets: a model for visual neuroscience.*
- 10/2014 – Transgenic primate models of the human brain, Minisymposium, The Society for Neuroscience, Washington, DC.
- *Active vision in marmosets: a model for visual neuroscience.*
- 10/2014 – Marmoset social, The Society for Neuroscience, Washington, DC
- *Visual behavioral experiments in awake marmosets.*
- 12/2013 – Transgenic models of the human brain. Cricks-Jacobs Symposium, La Jolla, CA
- *Active vision in marmosets: a New World for visual neuroscience.*
- 12/2013 – Invited seminar, Dr. Erika Sasaki and Dr. Hideyuki Okano, Keio University, Japan
- *Mechanisms of attention and the marmoset as a model for visual neuroscience*
- 10/2013 – Attention and Learning Neuroscience Satellite Meeting, La Jolla, CA
- *Neural mechanisms of spatial attention: reductions of ongoing cortical activity*
- 09/2013 – Physiology Dept. Seminar, Monash University, Melbourne, Australia
- *Active vision in marmosets: a New World for visual neuroscience*
- 07/2013 - Gordon Research Conference, Stonehill College, Easton, MA
- *The role of attention feedback in sensory processing.*
- 04/2013 – Neuroscience/psychology seminar, University of Arizona, Tucson, AZ.
- *Neural mechanisms of attention.*
- 01/2013 – Neuroscience special seminar, Psychology Dept, Vanderbilt U., Nashville, TN.
- *The role of attention feedback in sensory processing.*
- 07/2011 - Neuromorphic engineering summer school, Telluride, CO.
- *Introduction to the visual system, visual search, and top-down attention.*
- *Spatial attention decorrelates intrinsic noise fluctuations*
- 03/2009 – COSYNE Workshop, Modulation of cortical response by brain state, Snowbird, UT
- *Spatial attention decorrelates intrinsic noise fluctuations*

Publications

1. Nummela SU, Coop S, Cloherty SL, Boisvert CJ, Leblanc M, **Mitchell JF (2016)**. 'Psychophysical measurement of marmoset acuity and myopia' *Devel Neurobio. Accepted Author Manuscript*. *Doi:10.1002/denu.22467*.
2. Nandy, AS, **Mitchell, JF**, Jadi, MP, Reynolds, JH (2016). Neurons in Macaque Area V4 Are Tuned for Complex Spatio-Temporal Patterns. *Neuron*, 91(4), 920-930.
3. Divincenti, J., Miller, AD, Knoedl, DJ, **Mitchell, JF (2016)**. Uterine Rupture in a Common Marmoset (*Callithrix jacchus*). *Comparative Medicine*, 66(3), 254-258.
4. MacDougall M, Nummela SU, Coop S, Disney A, **Mitchell JF**, Miller CT (2016). Optogenetic manipulation of neural circuits in awake marmosets. *J Neurophysiol*, 116(3), 1286-94.
5. Miller CT, Friewald W, Leopold DA, **Mitchell JF**, Silva AC, Wang XJ (2016). 'Marmosets: a neuroscientific model of human social behavior.' *Neuron*, 90(2), 219-233.
6. **Mitchell, JF**, Priebe, NJ, & Miller, CT (2015). Motion dependence of smooth pursuit eye movements in the marmoset. *Journal of neurophysiology*, 113(10), 3954-3960.
7. Chow, CP*, **Mitchell, JF***, and Miller, CT (2015). Vocal turn-taking in a non-human primate is learned during ontogeny. *Proceedings of the Royal Society of London B: Biological Sciences*, 282(1807), 20150069.
8. **Mitchell, JF**, Leopold, DA (2015). The marmoset monkey as a model for visual neuroscience. *Neuroscience research*, 93, 20-46.
9. Belmonte, J.C.I., Callaway, E.M., Churchland, P., Caddick, S.J., Feng, G., Homanics, G.E., Lee, K.F., Leopold, D.A., Miller, C.T., **Mitchell, J.F.** and Mitalipov, S. (2015). Brains, genes, and primates. *Neuron*, 86(3), pp.617-631.
10. **Mitchell JF**, Boisvert CR, Reuter JD, Reynolds JH, Leblanc M (2014). 'Correction of refractive errors in rhesus macaques (*Macaca mulatta*) involved in visual research.' *Comparative Med*. 64(4):300-8.
11. **Mitchell JF**, Reynolds JH, and Miller CT (2014). 'Active vision in marmosets: a model system for visual neuroscience.' *J Neurosci*. 34(4): 1184-93.
12. Anderson EB, **Mitchell JF** and Reynolds JH (2013). 'Attention-dependent reductions in burstiness and action potential height in macaque area V4'. *Nature Neurosci*. 16(8):1125-31.
13. Nandy AS, Sharpee T, Reynolds JH, and **Mitchell JF** (2013). 'The fine structure of shape tuning in area V4'. *Neuron* 78(6):1102-15.
14. Sundberg KA, **Mitchell JF**, Gawne TJ and Reynolds JH (2012). 'Attention influences single unit and local field potential response latencies in visual cortical area V4'. *J Neurosci* 32:16040-50.
15. Anderson EB, **Mitchell JF**, and Reynolds JH (2011). 'Attentional modulation of firing rate varies with burstiness across putative pyramidal neurons in macaque visual area V4'. *J Neurosci* 31:10983-92.
16. Ciaramitaro VM, **Mitchell JF**, Stoner GR, Reynolds JH, and Boynton GM (2010). 'Object-based attention to one of two superimposed surfaces alters responses in human early visual cortex'. *J Neurophysiology* 105: 1258-65.
17. **Mitchell JF**, Sundberg KA, and Reynolds JH (2009). 'Spatial attention decorrelates intrinsic activity fluctuations in macaque area V4'. *Neuron* 63:879-888.

18. Sundberg KA, **Mitchell JF**, and Reynolds JH (2009). 'Spatial attention modulates center-surround interactions in macaque visual area V4'. *Neuron* 61:1-12.
19. Khoe W, **Mitchell JF**, Reynolds JH and Hillyard, SA (2008). 'ERP evidence that surface-based attention biases interocular competition during rivalry'. *Journal of Vision*, 8(3):18.1-11.
20. **Mitchell JF**, Sundberg KA, and Reynolds JH (2007). 'Differential attention-dependent response modulation across cell classes in macaque visual area V4'. *Neuron*, 55: 131-141.
21. Khoe W, **Mitchell JF**, Reynolds JH and Hillyard, SA (2005) 'Exogenous attentional selection of transparent superimposed surfaces modulates early event-related potentials'. *Vision Research*, 45(24):3004-14
22. Stoner GR, **Mitchell JF**, Fallah M and Reynolds JH (2005). 'Interacting competitive selection in attention and binocular rivalry'. *Progress in Brain Research*, 14:227-34.
23. **Mitchell JF**, Stoner GR and Reynolds JH (2004) 'Object-based attention in binocular rivalry'. *Nature*, 2004 May; Vol 429:410-413.
24. **Mitchell JF**, Stoner GR, Fallah M, and Reynolds JH (2003) 'Attentional selection of superimposed surfaces cannot be explained by modulation of the gain of color channels.' *Vision Research*. 2003 Jun;43(12):1323-8.
25. **Mitchell JF**, Zipser D (2003) 'Sequential memory-guided saccades and target selection: A neural model of the frontal eye fields.' *Vision Research*. 2003 43:2669-95.
26. **Mitchell JF**, Zipser D (2001) 'A model of visual-spatial memory across saccades.' *Vision Research*. 2001 41:1575-92.
27. Czeisler CA, Duffy JF, Shanahan TL, Brown EN, **Mitchell JF**, Rimmer DW, Ronda JM, Silva EJ, Allan JS, Emens JS, Dijk DJ, Kronauer RE (1999) 'Age-independent stability, precision, and near-24-hour period of the human circadian pacemaker.' *Science*. 1999 284:1-5.
28. Vassilev PM, **Mitchel JF**, Vassilev M, Kanazirska M, Brown EM (1997) 'Assessment of frequency-dependent alterations in the level of extracellular Ca^{2+} in the synaptic cleft.' *Biophysical Journal*. 1997 72:2103-6.