Eric E. Thomson

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Duke University
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Education

University of California, San Diego

Ph.D.: Neuroscience September 2004
Thesis Title: How the Leech and its Nervous System Discriminate Touch Location
Areas of Specialization: Sensory coding, behavioral neuroscience
Advisor: William B. Kristan

M.A.: Philosophy March 2004
Thesis Title: Concepts in People and Artificial Neural Networks
Areas of Specialization: Philosophy of mind, philosophy of science
Advisors: Patricia S. Churchland and Paul Churchland

University of New Hampshire

Summa Cum Laude
June 1996 *B.S. in Interdisciplinary Math Physics*
June 1994 *B.S. in Ecology and Evolutionary Biology*
June 1994 *B.A. in Philosophy*

Research Expertise

-Behavioral neuroscience
-Sensory coding and plasticity in the cerebral cortex
-Sensory prosthetic systems

Grants

*7/1/07 - 6/30/*10: NRSA Postdoctoral Grant Principal Investigator
NIH Grant Number: F32NS055522
Title: Adaptive sensory coding in rat somatosensory cortex
Direct Costs: $154,278

Peer-Reviewed Publications (*:Authors contributed equally)

Thomson, EE, Lou, J, Sylvester, K, McDougal, A, Tica, S, Nicolelis, MAL (submitted) Basal forebrain during a tactile discrimination task.

Thomson, EE, Carra, R, and Nicolelis, MAL (2013) Perceiving Invisible Light through a Somatosensory Cortical Prosthesis. Nature Communications. 4: 1482, 10.1038/ncomms2497.

Wiest, MC*, Thomson, EE*, Pantoja, J, and Nicolelis, MAL (2010) Changes in S1 Neural Responses During Tactile Discrimination Learning. Journal of Neurophysiology, 104:300-312.

Thomson E.E. and Kristan W.B. (2006) Encoding and Decoding Touch Location in the Leech CNS. J. Neurosci. 26: 8009-8016.

Thomson E.E. and Kristan W.B. (2005) Quantifying stimulus discriminability: A comparison of information theory and ideal observer analysis. Neural Computation 17: 741-778.

Baca S.M.*, Thomson E.E.*, and Kristan W.B. (2005) Location and intensity discrimination in the leech local bend response quantified using optic flow and principal components analysis. J. Neurophys. 93: 3560-72.

Review chapters and articles

Wiest, M, and Thomson, EE, Meloy, J (2008) Multielectrode recordings in the somatosensory system. Chapter 6 in Nicolelis MAL, editor. Methods for Neural Ensemble Recordings. 2nd edition. Boca Raton (FL): CRC Press.

Wiest, MC, Thomson EE, Nicolelis MAL (2007). Twenty Five Years of Multi-Electrode Recordings in the Somatosensory System. In: The Senses: A Comprehensive Reference. (eds-Basbaum et al) Academic Press, San Diego CA.

Conference Abstracts

Thomson, EE, Sylvester, K, Takigami,Â, Lou, J, Nicolelis, MAL (2013) Population coding of stimulus and reward in rat basal forebrain. SFN Abstract 581.07.

Thomson, EE, Lou, J, McDonough, A, Nicolelis, MAL (2011) Basal forebrain activity during a tactile discrimination task. SFN Abstract 495.24.

Thomson, EE, Meloy, J, and Nicolelis, MAL (2010) Whisker-based aperture width discrimination in the mouse. SFN Abstract 285.17.

Thomson, EE, Lehew, G, and Nicolelis, MAL (2007) Multielectrode design for simultaneously recording from rat primary and secondary somatosensory cortices. SFN Abstract 403.16.

Thomson, EE, Wiest, MC, Pereira, A, and Nicolelis, M (2005) A behavioral paradigm for the study of category discrimination in the rat whisker system. SFN Abstracts 883.6.

Thomson, E.E., and Kristan W.B. (2004) Encoding and decoding touch location in the leech. Computational and Systems Neuroscience (CoSyne) abstract (Cold Spring Harbor).

Thomson, E.E. and Kristan W.B. (2003) Mechanoreceptor latency encodes touch location in the leech. SFN Abstracts 269.4.

Thomson E.E., Churchland P.S., and Kristan W.B. (2001) EMG in the leech (H. medicinalis) body wall: A signal-to-noise analysis. SFN Abstracts 518.4.

Talks

Perceiving Invisible Light through a Somatosensory Cortical Prosthesis. Barrels XXV New Orleans, LA, October 2012; NIH Bethesda, August 2012; Duke Neurobiology Retreat November 2012.

A comparison of information theory and ideal observer analysis in the study of coding. NIPS workshop December 2006.

Coding and decoding touch location in the leech. NIPS workshop December 2006.

Awards and Fellowships

2012: Best postdoc talk: Duke University Neurobiology Retreat
2001-2002: Merck Pharmaceuticals Research Fellow
2000: Systems and Integrative Neurosciences (SAIN) Training Grant
1995: Phi Beta Kappa
1993: UNH Summer Undergraduate Research Fellowship

Research Experience

Fall 2004-Present: Duke University Postdoctoral Fellow (Durham, NC)
Topics: Sensory coding and plasticity in the rat somatosensory cortex. Sensory prosthetics.
Methods: Construction and implantation of recording and stimulating electrodes in rats. Extensive analysis of video and physiological data (Matlab) from awake behaving rats.
Advisor: Miguel Nicolelis

Spring 2000-Summer 2004: University of California, San Diego.
Topic: Touch location discrimination in the leech and its CNS.
Methods: Intracellular and extracellular recording and stimulation from pairs of neurons in the leech; multiple-site electromyography (EMG) ; image processing; extensive coding in Matlab.
Advisor: William B. Kristan

Fall 1999-Winter 2000: Salk Institute (La Jolla, CA)
Topic: Analysis of motion coding in primate retinal ganglion cells.
Methods: Sorting retinal ganglion cell spikes recorded from a multielectrode array; application of pattern classification algorithms to neural data; extensive coding in LISP.
Advisor: E.J. Chichilnisky

Teaching Experience

Spring 2008-10: Lectures on Somatosensory Processing (Duke)
Summer 2000-2004: Neuroscience Boot Camp TA (UCSD)
Spring 2001: *Computational Neuroscience* TA for Terrance Sejnowski (UCSD)
Fall 2000-Winter 2001: *Calculus I-Calculus III* TA (UCSD)
Spring 1997: *Inductive Logic* TA (UCSD)
Winter 1997: *Introductory Logic* TA (UCSD)

References available upon request