

## **Eric E. Thomson**

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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 (Work completed Fall 1999)

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 Interests**

Sensory coding and plasticity in the somatosensory system of rodents.

Sensory prosthetics.

### **Peer-Reviewed Publications** (\*:Authors contributed equally)

Thomson, EE, and Nicolelis, MAL (in preparation) Basal forebrain and S1 activity coupling during a tactile discrimination task.

Thomson, EE, Carra, R, and Nicolelis, MAL (under review) Perceiving Invisible Light through a Somatosensory Cortical Prosthesis.

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, 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 Poster (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.
- 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

- 2006-2009: Personal NRSA Award for study of somatosensory coding in the rat
- 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

**Summer 1999:** University of California, San Diego

*Topic:* Influence of prefrontal cortex damage on human perception of social interactions.

*Methods:* Interviewing and scoring questionnaires for neuropsychological subjects.

*Advisor:* V.S. Ramachandran

**Fall 1995-Spring 1996:** University of New Hampshire (Durham, NH).

*Topic:* Using telemetry to track lobster locomotion in the Atlantic Ocean.

*Methods:* Wrote C program to port data between platforms.

*Advisor:* Winsor Watson

**Summer 1993:** University of New Hampshire (Durham, NH).

*Topic:* Molecular systematics of Atlantic Tomcod (*G. morhua*) populations.

*Methods:* PCR, Sanger sequencing, phylogeny construction.

*Advisor:* Thomas D. Kocher

## **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)

Fall 1998- Spring 1999: *Humanities* TA (UCSD)

Spring 1997: *Inductive Logic* TA (UCSD)

Winter 1997: *Introductory Logic* TA (UCSD)

Fall 1997: *Ethics and Society* TA (UCSD)

Spring 1994: *Introductory Logic* TA (UNH)

## **References available upon request**