

# Vivienne L'Ecuyer Ming

Mind, Brain & Computation Center  
Jordan Hall, Bldg. 420  
450 Serra Mall  
Stanford, CA 94305 USA  
[neuraltheory@gmail.com](mailto:neuraltheory@gmail.com)

## Current Position

2006- Junior Fellow – Mind, Brain and Computation Center, Stanford University (Palo Alto, CA)  
2006- Postdoctoral Fellow – Redwood Center for Theoretical Neuroscience, UC Berkeley

## Primary Research Interests

Information theoretic models of the of sensory and cognitive computation

## Education

- 2006 Ph.D., Psychology, Carnegie Mellon University (Pittsburgh, PA)
- Thesis Title: *Efficient auditory coding*
  - Advisor: Michael Lewicki
  - Center for the Neural Basis of Cognition Graduate Training Fellow
- 2003 M.S., Psychology, Carnegie Mellon University (Pittsburgh, PA)
- Thesis Title: *Efficient coding of time-relative structure in audition*
  - Advisor: Michael Lewicki
- 2000 B. S., Cognitive Neuroscience, University of California, San Diego (La Jolla, CA)
- Thesis Title: *A Snow-based facial feature detector*
  - Advisor: Javier Movellan

## Papers

- Ming, V.** & Holt, L. (submitted) Evidence of efficient coding in human speech perception. *Psychological Science*.
- Smith, E.** & Lewicki, M. (2006) Efficient auditory coding. *Nature*. Vol. 439, Num. 7079.
- Smith, E.** & Lewicki, M. (2005) Efficient coding of natural sounds using spikes predicts cochlear filters. *Advances in Neural Information Processing Systems 17*. MIT Press, Cambridge, Massachusetts.
- Smith, E.** & Lewicki, M. (2005) Efficient coding of time-relative structure in natural sounds using spikes. *Neural Computation*. Vol. 17, Num. 1.
- Bartlet, M. S., Braathen, B., Littlewort, G., **Smith, E.** & Movellan, J. (2003) An approach to automatic recognition of spontaneous facial actions. *Advances in Neural Information Processing Systems 15*. MIT Press, Cambridge, Massachusetts.

## Conference Presentations

- Ming, V.** (2007) The spectrotemporal density components of speech.. *Computational Cognitive Neuroscience*. San Diego, CA.
- Ming, V.** & Lewicki, M. (2007) Cross-linguistic evidence of adaptation of speech statistics to the mammalian auditory code. *Computational Cognitive Neuroscience*. San Diego, CA.
- Ming, V.** & Wang, J. (2007) Learning invariant structure in speech sounds using subspace sparse coding. *Computational Cognitive Neuroscience*. San Diego, CA.
- Smith, E.** & Holt, L. (2006) A theoretical model of cochlear processing improves spectrally-degraded speech perception. *Annual Meeting of the Acoustical Society of America*. Providence, RI.
- Smith, E.** & Lewicki, M. (2006) Efficient auditory coding. *IGERT 2006 Annual Meeting*. Arlington, VA.
- Smith, E.** & Holt, L. (2006) A theoretical model of cochlear processing improves simulated cochlear implant hearing. *Computational and Systems Neuroscience*. Salt Lake City, UT.

- Smith, E.** & Lewicki, M. (2004) Spike codes using populations of stochastic units. Presented at the *Gordon Conference on Sensory Coding and the Natural Environment*. Queen's College, Oxford, UK.
- Smith, E.** & Lewicki, M. (2004) Efficient coding of acoustic structure with spike times. Presented at the *Computational and Systems Neuroscience Conference*. Cold Springs Harbor, NY.
- Braathen, B., Bartlet, M. S., Littlewort, G., **Smith, E.** & Movellan, J. (2002) An approach to automatic recognition of spontaneous facial actions. Presented at the *Conference on Face and Gesture Recognition*.
- Smith, E.**, Bartlet, M. & Movellan, J. (2001) Computer recognition of facial actions: A study of co-articulation effects. Proceedings of the *8th Symposium on Neural Computation*.
- Golan, T., Acenas, L. & **Smith, E.** (2001) Tip-of-the-Tongue incidence in Spanish-English and Tagalog-English Bilinguals. Presented at the *3rd International Symposium on Bilingualism*.

### Technical Reports

- E. Smith** & Movellan, J. (2001) A SNoW-based facial feature detector. Technical Report UCSD MPLAB TR 2001.06, University of California, San Diego.
- M. Bartlett, B. Braathen, G. Littlewort-Ford, J. Hershey, I. Fasel, T. Marks, **E. Smith**, T. Sejnowski, and J. Movellan (2001) Automatic analysis of spontaneous facial behavior: A final project report. Technical Report UCSD MPLab TR 2001.08, University of California, San Diego.

### Teaching & Mentoring Experience

- Fall 2004 Teaching Assistant, Biological Foundations of Psychology, CMU, Prof. Lori Holt
- Spring 2004 Teaching Assistant, Computational Perception, CMU, Prof. Michael Lewicki
- Fall 2003 Teaching Assistant, Cognitive Psychology, CMU, Prof. Patricia Carpenter
- Spring 2003 Teaching Assistant, Parallel Distributed Processing, CMU, Prof. David Plaut
- Spring 2000 Teaching Assistant, C for Cognitive Modeling, UCSD, Prof. John Batali 2004
- 1999, 2004 Supervised and trained undergraduate research assistants.

### Fellowships and Awards

- 2005 Phi Kappa Phi Honors Society
- 2004 IGERT Graduate Research Fellowship
- 2000 Graduated with Honors, Cognitive Science Dept., UCSD

### Editorial Activities

- Cognitive Science (Reviewer), Brain Research (Reviewer)

### Additional Research Experience

- 2006 Postdoctoral Fellow, Center for the Neural Basis of Cognition, Carnegie Mellon University
- Developed Hierarchical Statistical Model of Sound Coding
  - Wrote review paper of the efficient coding of sound
- 2000-01 Graduate Research Assistant, Machine Perception Lab, Institute for Neural Computation, University of California, San Diego
- Developed face and eye tracking algorithms
  - Trained and supervised undergraduate research assistants
- 1999 Research Assistant, Center for Research in Language, Cognitive Science Dept., University of California, San Diego
- Created picture and word naming stimuli. Collected and analyzed data

### Additional Professional Experience

- 1997-99 General Manager, Pacific Mariculture Inc., Santa Cruz, CA
- 1994-96 General Partner, HardDrive Productions, San Diego, CA