

Engineering Neuroscience & Health

Department of Biomedical Engineering

Division of Biokinesiology and Physical Therapy



ENH SEMINAR SERIES



Presents:

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Monday

April 18, 2011

4:00 p.m.

Refreshments served: 3:30– 4 pm

“Vibrissal Dynamics and the Tactile Exploratory Behavior of the Rat”

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<http://www.mech.northwestern.edu/hartmann/people.html>

It is easy for you to reach into your pocket or purse and – without looking – identify your keys, a coin, or a paperclip. Somehow, your brain transforms the patterns of mechanical input on your fingertips into the robust perception of an object. How is this tactile feat accomplished? The first step towards answering this question is to quantify the patterns of mechanical input that your brain must interpret. Our laboratory uses the rat vibrissal (whisker) system as a model to understand how the sense of touch is integrated with movement to enable tactile perception. Rats rhythmically brush and tap their whiskers against objects to tactually extract features such as shape and texture. In this talk I will describe our laboratory's recent advances in quantifying the complete mechanosensory input to the rat vibrissal array during natural exploratory behaviors and discuss implications of these results for neural processing. I will specifically focus on our laboratory's efforts to develop a simulation environment that permits full dynamical simulations of vibrissal-object contact. We aim to integrate realistic vibrissal dynamics with behaviorally-measured head and vibrissal kinematics to model the rat's sampling strategies for various objects in the environment. Ultimately, the simulation system will be used to predict contact patterns in terms of the mechanics at each vibrissa base for a given exploratory sequence, and thus predict the input to the brain. Supported by NSF awards IOS-0818414, IOS-08090000.

Locations: *Seminar is simultaneously presented*

UPC: HNB 100 — LIVE
Hedco Neurosciences Building

UPC Campus Map/Directions:
<http://www.usc.edu/about/visit/upc/>

HSC: CHP 147 – Video Conference
Center for the Health Professional

HSC Campus Map/Directions:
<http://www.usc.edu/about/visit/hsc/>

Organized by Professor Francisco Valero-Cuevas <http://bme.usc.edu/valero/>

Web Cast

<http://capture.usc.edu/college/Catalog/pages/catalog.aspx?catalogId=946350f1-ca84-40e7-b867-e16adba01e4e>

Information about all seminars can be found at
<http://bbdl.usc.edu/ENH-Schedule.php>