

*14th Annual BMSR Workshop
on
Advanced Methods
of
Physiological System Modeling*

*University of Southern California
Biomedical Simulations Resource (BMSR)*

Marina Beach Marriott Hotel
4100 Admiralty Way
Marina del Rey, California

Sponsored by

BIOMEDICAL TECHNOLOGY PROGRAM
NATIONAL CENTER FOR RESEARCH RESOURCES
NATIONAL INSTITUTES OF HEALTH

Chairman & Organizer
Vasilis Z. Marmarelis, Ph.D.
Theodore W. Berger, Ph.D.

**THE
BMSR**

Biomedical Simulations Resource
University of Southern California
Olin Hall 500
Los Angeles, CA 90089-1451
Tel: (213) 740-0342
Fax: (213) 740-0343
<http://www.usc.edu/dept/biomed/BMSR>

Workshop Schedule

Friday, November 13, 1998

8:45	Introductory Remarks	Vasilis Marmarelis University of Southern California
9:00	What We Can Learn from Second-Order Kernels About Tuning in the Vertebrate Ear	Ted Lewis University of California, Berkeley
9:30	Two Phenomena in Spatiotemporal Maps of Cortical Receptive Fields: Does Spiking Confer Special Properties on Kernels? Are Some Spikes More Special than Others?	Jonathan Victor Cornell University Medical College
10:00	Chaos and Rhythmicity in Biological and Artificial Neural Networks	Berj Bardakjian University of Toronto
10:30	Break	
10:45	Two-Bar Nonlinear Interactions in Subunits are Necessary and Sufficient to Explain Movement Responses in Cortical Neurons	Robert Emerson & William Vaughn University of Rochester
11:15	Two-Bar Interaction Fields Simulations for a Spatio-Temporal Gradient Motion Model	Alan Johnston University College London
11:45	Striate Cortex Enhances Contrast Gain of Macaque LGN Neurons: Implications for Structural Modeling Based on White Noise Stimulus-Response Data	Daniel Pollen & Andrzej Przybyszewski University of Massachusetts Medical Center
12:15	Lunch	
1:30	Nonlinear Analysis of a Spider Mechanoreceptor Using Principal Dynamic Modes	Andrew French Dalhousie University, Halifax
2:00	Nonlinear Analysis of Binocular Neurons in the Cat's Striate Cortex	Akiyuki Anzai University of California, Berkeley
2:30	Detection and Analysis of Lateral Nonlinear Mechanisms in Systems with a Large Number of Parallel Inputs	Erich Sutter Smith-Kettlewell Eye Research Foundation (San Francisco)
3:00	Break	
3:15	Dynamic Spectral Envelope Processing in the Cat Auditory Midbrain	Monty Escabi University of California, San Francisco
3:45	Distinguishing Inner Ear Disease Using a Nonlinear Systems Identification Procedure	Mark Chertoff & David Lerner University of Kansas
4:15	The Structural and Functional Plasticity of the Subcortical Visual Receptive Fields	Yuri Danilov University of Wisconsin-Madison
4:45	Modeling Methodology for Nonlinear and Nonstationary Physiological Systems with Multiple Inputs	Vasilis Marmarelis University of Southern California
5:15	Reception	

Workshop Schedule

Saturday, November 14, 1998

- | | | |
|-------|---|---|
| 9:00 | Nonlinear Systems Analysis of the Mammalian Hippocampus: Experimental Characterization, Modeling and Analog VLSI Implementation | Theodore Berger
University of Southern California |
| 9:30 | Indicators of Functional Anatomic Connectivity Derived from Population Analyses of Hippocampal Neural Ensembles | Samuel Deadwyler & Robert Hampson
Wake Forest University
School of Medicine |
| 10:00 | Role of Nonlinear Synaptic Dynamics in Temporal and Spatio-Temporal Pattern Recognition | Jim-Shih Liaw
University of Southern California |
| 10:30 | Break | |
| 10:45 | Photonic Implementation of Neural Networks | Armand Tanguay
University of Southern California |
| 11:15 | A Comparison of Orthogonal Search and Canonical Variate Analysis for the Identification of Neurobiological Systems | Robert J. Sclabassi
University of Pittsburgh |
| 11:45 | On the Usefulness of a Unifying Formalism to Integrate Physiological Functions. The Example of the S-Propagators | Gilbert Chauvet
Institut de Biologie Theorique, France |
| 12:15 | Lunch | |
| 1:30 | Minimal Realizations of the Hodgkin-Huxley Equations | Gary Green
Newcastle Medical School
United Kingdom |
| 2:00 | Special Neural System Configurations that Provide Feedforward Signal Redundancy | George Swanson
McLeod Institute of Simulation Sciences
California State University, Chico |
| 2:30 | Scaling Properties of the Time Intervals Between Arrhythmic Events in the Heart | Larry Liebovitch
Florida Atlantic University |
| 3:00 | Break | |
| 3:15 | Modeling the Effects of Viewing Distance and Rotation Axis Location on Primate Vestibulo-Ocular Reflex | Olivier Coenen
The Salk Institute for Biological Studies
University of California, San Diego |
| 3:45 | Visual Programming Environment for Physiological System Analysis and Other Applications | Edward Lipson
Syracuse University |
| 4:15 | Could There be Real-Time, Instantaneous Learning in the Brain? | Asim Roy
Arizona State University |
| 4:45 | Open Discussion | |