

BIOMEDICAL SIMULATIONS RESOURCE  
UNIVERSITY OF SOUTHERN CALIFORNIA

WORKSHOP ON

**BIOLOGICAL AND ARTIFICIAL NEURAL NETWORKS:  
A SEARCH FOR SYNERGY**

SEPTEMBER 20-21, 1996

Summer House Inn  
7955 La Jolla Shores Drive  
La Jolla, California

Sponsored by

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

Workshop Organizers:  
Vasilis Z. Marmarelis and Theodore W. Berger

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**Friday, September 20, 1996**

- 8:15 **Registration/Check-in**
- 8:45 **Opening remarks**  
*V.Z. Marmarelis, University of Southern California*
- 9:00 **Nonlinear modeling of neural systems using artificial neural networks**  
*V.Z. Marmarelis and K. Alataris, University of Southern California*
- 9:30 **Analysis of neural encoding using "stimulus reconstruction" expansion and other approaches**  
*J.P. Miller, University of California at Berkeley*
- 10:00 **Memory of neuronal networks: The white-noise approach**  
*B. Bardakjian, University of Toronto*
- 10:30 **Coffee Break**
- 10:45 **Identification of higher order nonlinearities of hippocampal neurons using feedforward artificial neural networks**  
*M. Saglam and T.W. Berger, University of Southern California*
- 11:15 **Decoding biological spike trains with artificial neural nets**  
*P. Reinagel, California Institute of Technology*
- 11:45 **Lunch Break**
- 1:15 **Complex cell responses based on center-surround inputs: The surprising power of intradendritic computation**  
*B.W. Mel, University of Southern California*
- 1:45 **Spectral and temporal resolution of complex auditory neurons in the bird song**  
*F.E. Theunissen, University of California at San Francisco*
- 2:15 **A model for how the cerebellum may anticipate neural signals and modulate the vestibulo-ocular reflex**  
*J.M.D. Coenen and T.J. Sejnowski, The Salk Institute*
- 2:45 **Coffee Break**
- 3:00 **On multi-level modeling of biological neural networks**  
*G. Chauvet, University of Angers, France*
- 3:30 **Brain-like learning: Some ideas**  
*A. Roy, Arizona State University*
- 4:00 **Information theory and the design of insect eyes**  
*D.L. Ruderman and S.B. Laughlin, University of Southern California*
- 4:30 **Nonstationary modeling of neural systems using artificial neural networks**  
*M. Iatrou and V.Z. Marmarelis, University of Southern California*
- 5:00 **Reception: "North Shore Room"**

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Saturday, September 21, 1996

- 8:45 **Opening remarks**  
*T.W. Berger, University of Southern California*
- 9:00 Spatio-temporal coding by neural network models incorporating  
biologically realistic synaptic dynamics  
*T.W. Berger and J.S. Liaw, University of Southern California*
- 9:30 Statistical approaches designed to extract hippocampal representations for  
applications to closed-loop feedback models  
*S. Deadwyler and R. Hampson, Bowman & Gray School of Medicine*
- 10:00 Biologically realistic neural network model of hippocampus  
*R. Granger, University of California at Irvine*
- 10:30 **Coffee Break**
- 10:45 Neural network model for analysis in cortical processing of millisecond time range  
*K. Nakamura, Tokyo Institute of Technology*
- 11:15 Nonlinear spatio-temporal interactions and neural connections in human vision using transient and short  
M-sequence stimuli  
*H.W. Chen, Los Alamos National Laboratory*
- 11:45 **Lunch Break**
- 1:15 Dynamic temporal codes as wavelet packet representations and networks  
*S. Dear, Pennsylvania State University*
- 1:45 On the maximization of entropy in the nervous system, maximum likelihood density estimation, and blind  
source separation  
*B. Pearlmutter, University of California at San Diego*
- 2:15 Blind separation of event-related brain responses into independent components  
*S. Makeig, T.P. Jung, A. Bell and T.J. Sejnowski,  
University of California at San Diego*
- 2:45 **Coffee Break**
- 3:00 Expressional interfaces for the disabled: Do neural networks have a role?  
*E. Lipson and D. Warner, Syracuse University*
- 3:30 Neuromorphic hardware: Analog? Digital? Who cares? Who needs it?  
*S. Deiss, Applied Neurodynamics*
- 4:00 EONS: Multilevel modeling of neural systems  
*J.S. Liaw, Y. Shu and T.W. Berger, University of Southern California*
- 4:30 **Closing remarks** (reception to follow in the "South Shore Room")

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1996 Workshop on

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September 20-21, 1996  
La Jolla, California

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