CRCNS PI Meeting
October 16-18, 2014
Tempe Mission Palms Hotel and Conference Center
Tempe, AZ

Program
Workshop on Open Science and Resources for Computational Neuroscience
Thursday, October 16, 2014
Arizona State University, Memorial Union, Pima Room

MORNING SESSION
8:45  Welcome, Ken Whang, National Science Foundation & Yuan Liu, National Institutes of Health
9:00-9:10  Richard Gerkin, Arizona State University
           Introduction to the Workshop Themes
9:10-9:30  Yoonsuck Choe, Texas A&M University
           Open Web Atlas for High-resolution 3D Mouse Brain Data
9:30-10:00  Shreejoy Tripathy, University of British Columbia
           NeuroElectro.org: Making the World's Neurophysiology Data Available for Reuse
10:00-10:30  Mitra Hartmann, Northwestern University
           The Digital Rat: Tools for Modeling the Vibrisso-Tactile Natural Scene
10:30-10:50  Coffee Break
10:50-11:30  Lydia Ng, Allen Institute for Brain Science
           Overview of the Allen Brain Atlas Data, Tools, and API
11:30-12:00  Friedrich Sommer, University of California, Berkeley
           The NeuroData Without Borders Project and the CRCNS.org Repository
12:00-1:00  Lunch on Your Own

AFTERNOON SESSION
1:00-1:40  Stephen Larson, OpenWorm.org
           OpenWorm: Open Collaboration in Computational Neuroscience Focused on C. elegans
1:40-2:10  Sharon Crook, Arizona State University
           Collaborative Modeling with NeuroML and the Open Source Brain Project
2:10-2:40  Richard Gerkin, Arizona State University
           SciUnit: Data-driven Validation of Models for Neuroscience
2:40-3:00  Afternoon Break
3:00-4:00  Panel Discussion on Open Science and Resources
CRCNS Main Meeting  
October 16-18, 2014  
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THURSDAY, October 16, 2014

5:00-8:00  Registration Available  
6:00-9:00  Reception, Courtyard of Tempe Mission Palms Hotel and Conference Center

FRIDAY, October 17, 2014

8:00-5:00  Registration Available  
8:30  Welcome

8:40-9:00  Ramping vs. Stepping: Continuous and Discrete Latent Dynamical Models of Decision Signals Underlying Spike Trains in Parietal Cortex  
Jonathan Pillow, Kenneth Latimer, Jacob Yates, Miriam Meister, Alex Huk

9:00-9:20  Signal and Noise in the Retina’s Population Code for Direction  
Eric Shea-Brown, Joel Zylberberg, Jon Cafaro, Max Turner, Fred Rieke

9:20-9:40  How Dynamic is Encoding? State-dependent Feature Selectivity in Tactile Sensing  
Clarissa Shephard, Christian Waiblinger, Cornelius Schwarz, Garrett B. Stanley

9:40-10:00  A Nonparametric Bayesian Approach to Uncovering Rat Hippocampal Population Codes During Spatial Navigation  
Zhe Chen, Scott Linderman, Matthew A. Wilson

10:00-10:10  Discussion led by Frederic Theunissen

10:10-10:30  Break

10:30-10:50  Adaptation Tunes Cortical Dynamics to a Critical Regime during Vision  
Woodrow Shew, Wesley Clawson, Jeff Pobst, Yahya Karimipanah, Ralf Wessel

10:50-11:10  Cytoskeletal Mechanisms of Dendrite Arbor Shape Development  
Giorgio A. Ascoli, Dan N. Cox

11:10-11:30  Modeling the Effects of Neuronal Morphology on Dendritic Chloride Diffusion and GABAergic Inhibition  
Namrata Mohapatra, Songqing Lu, Fidel Santamaria, Peter Jedlicka

11:30-11:50  Synaptic Input Required for Firing is Modulated by Extracellular Electric Fields  
Belen Lafon, Asif Rahman, Marom Bikson, Lucas C. Parra

11:50-12:00  Discussion led by William L. Kath

12:00-2:00  Box Lunch and Poster Session 1
2:00-2:50 Plenary Lecture: High-Throughput Experimental and Computational Exploration of the Cortex
Anton Arkhipov, Allen Institute for Brain Science

2:50-3:10 Overview of Open Science and Resources Workshop
Friedrich Sommer, University of California, Berkeley

3:10-3:30 Discussion of federal funding opportunities

3:30-3:50 Break

3:50-4:10 Molecular Simulation of Calcium Transients in a Spine
Mary Kennedy, Thomas Bartol, Daniel Keller, Justin Kinney, Chandrajit Bajaj, Kristen Harris, Terrence Sejnowski

4:10-4:30 Atypical PKCs in the Maintenance of Memory: Molecular Model, Experimental Verification
Harel Z. Shouval, Sajiya J. Jalil, Todd Charlton Sacktor

4:30-4:50 Computational Modeling of the Molecular Machinery Involved in Membrane Fusion
Maria Bykhovskaiia, Chung-Yuen Hui, Anand Jagota, Troy Littleton

4:50-5:00 Discussion led by Fidel Santamaria

6:00 Banquet at Tempe Mission Palms Hotel and Conference Center
Plenary Lecture: Sleights of Mind
Stephen Macknik, SUNY Downstate Medical Center

SATURDAY, October 18, 2014

8:00-5:00 Registration Available

8:30 Welcome

8:40-9:30 Plenary Lecture: Pre-processing of Sensory Information for Cortical Associative Learning: Distinct Roles for Nicotinic and Muscarinic Cholinergic Receptors
Christiane Linster, Cornell University

9:30-9:50 Cortical Variability, Perception-based Decisions, and Network Activity
Yuwei Cui, Liu D. Liu, James M. McFarland, Christopher C. Pack, Daniel A. Butts

9:50-10:10 Cognitive Modulation of Oculomotor Activity in the Frontal Cortex of Monkeys Performing a Simple Reaction-time Task with Reward Bias
Christopher K. Hauser, Dantong Zu, M Gabriela Costello, Terrence R. Stanford, Emilio Salinas

10:10-10:30 Break
10:30-10:50  Neural Constraints on Learning  
Patrick T. Sadtler, Kristin M. Quick, Matthew D. Golub, Steven M. Chase, Stephen I. Ryu, Elizabeth C. Tyler-Kabara, Byron M. Yu, Aaron P. Batista

10:50-11:10  Phase Transitions in the Auditory Cortex of Gerbils During Reinforcement Learning Indicating Strategy Change  
Robert Kozma, Frank Ohl

11:10-11:30  Mixed Selectivity and Multiplexing of Visual and Cognitive Encoding during Category Learning  
Arup Sarma, Xiao-Jing Wang, David J. Freedman

11:30-11:50  A Novel Neocortical Beta Origin Hypothesis: Converging Evidence from Humans, Computational Modeling, Monkey, and Mouse  
Stephanie Jones, Christopher Moore

11:50-12:00  Discussion led by Ranu Jung

12:00-2:00  Box Lunch with Poster Session 2

2:00-2:20  Emergence of a Reliability Code in the Owl's Midbrain  
Fanny Cazettes, Brian J. Fischer, Jose Pena

2:20-2:40  Encoding Models Reveal How and When the Meaning of Communication Calls is Extracted by the Avian Auditory Cortex  
Julie Elie, Hedi Soula, Frederic Theunissen

2:40-3:00  Key Features from Texture, Shading, and Color Flows Enable Surface Inferences  
Roland Fleming, Steven W. Zucker

3:00-3:10  Discussion led by Bruno Olshausen

3:10-3:30  Break

3:30-3:50  Neural Restoration via Loop-based Reinforcement: A Mechanism of Therapeutic High Frequency Stimulation in Parkinson’s Disease  
Sabato Santaniello, Michelle M. McCarthy, Erwin B. Montgomery, John T. Gale, Nancy Kopell, Sridevi V. Sarma

3:50-4:10  Computation-Enabled Ventilatory Control System (CENAVEX)  
Ranu Jung, Sylvie Renaud, James Abbas, Yannick Bornat, Brian Hillen, Adeline Zbrzeski, Ricardo Siu, Jonathan Castelli, Brett Davis, Florian Kolbl

Kenneth A. Norman, Jeremy R. Manning, Kimberly L. Stachenfeld, Rajesh Ranganath, Naseem Al-Aidroos, Alexa Tompary, Nicholas Turk-Browne, David M. Blei

4:30-4:50  Cortical Representation of Phonetic, Syntactic and Semantic Information during Speech Perception and Language Comprehension  
Jack L. Gallant, Alex T. Huth, Wendy A. de Heer, Lydia L. Mjur, Thomas L. Griffiths, Frederic E. Theunissen

4:50-5:00  Discussion led by Luisa Ciobanu

Dinner on your own. Social gathering to be announced!
# Poster Session 1

#1 Multimodal fMRI and EEG Neuroimaging Investigation of Binocular Rivalry
Abhrajeet Roy, Sucharit Kytal, Vadim Petruk, Sheng He, Steve Engel, Bin He

#2 Time Integration in Mushroom Bodies and Olfaction Learning
Thiago Mosqueiro, Martin Strube-Bloss, Maxim Bazhenov, Brian Smith, Ramon Huerta

#3 Deep Brain Stimulation to the Parkinsonian Subthalamic Nucleus Can Restore Function in Striatal Networks: A Model
Michelle M. McCarthy, Nancy Kopell, Xue Han

#4 Origin and Propagation of Parkinsonian Beta Oscillations in the Basal Ganglia-thalamo-cortical Loop
Xue Han, Boston University

#5 Coherent Neuronal Ensembles are Rapidly Recruited when Selecting a Movement Plan
Bijan Pesaran, Nathaniel Daw

#6 Ultra-rapid Object Localization: Shortcuts in the Brain's Visual Hierarchy?
Florence Campana, Jacob Martin, Levan Bokeria, Ben Trans, Xiong Jiang, Simon Thorpe, Maximilian Riesenhuber

#7 Laminar Structure of Gamma Activity in Cat Visual Cortex
Urs Koester, Charles Gray

#8 A Model for VTA Circuitry: Toolbox for the Study of Addictions
A. Kuznetsov, B. Gutkin, M. Mamelli, C. Lapish

#9 Do V1 Neurons Have Receptive Fields?
Bruno Olshausen, Urs Koester, Charles Gray, Chris Rozell

#10 Advancing Models of Shape Selectivity in V4
Dina Popovkina, Eric Nicholas, Majid Moshtagh, Anitha Pasupathy, Wyeth Bair

#11 Does Rate Remapping Interfere with Phase Coding in Hippocampal Place Cells?
Honi Sanders, Daoyun Ji, John Lisman

#12 Odor Transformations through Multiple Layers of the Insect Olfactory System
Pavel Sanda, Tiffany Kee, Nitin Gupta, Mark Stopfer, Maxim Bazhenov

#13 Central Pattern Generators (CPGs) Must Integrate Sensory Feedback in order to Respond Adaptively in Variable Environments
#14 Artificial Intelligence in Systems Medicine: Finding a Treatment for Paralysis

#15 A Mutual Connectivity Analysis (MCA) Framework with Convergent Cross-mapping and Non-metric Clustering
Axel Wismueller, Xixi Wang, Adora M. DSouza, Lutz Leistritz

#16 Impact of Multivariate Granger Causality Analyses with Embedded Dimension Reduction on Network Modules
Lutz Leistritz, Axel Wismueller, Mahesh Nagarajan, Herbert Witte, Britta Pester, Christoph Schmidt

#17 The Hierarchical Topographic Factor Analysis MATLAB Toolbox
Jeremy R. Manning, Kimberly L. Stachenfeld, Rajesh Ranganath, Kenneth A. Norman, David M. Blei

#18 Converging Catalogues, Warehouses, and Deployment Logistics into a Federated "Data Distribution"
Yaroslav O. Halchenko, Michael Hanke

#19 NeuroML: Model Exchange in Computational Neuroscience
Sharon Crook, Suzanne Dietrich

#20 Principles of High Fidelity, High Density Neural Recording
Caroline Moore-Kochlacs, Jorg Scholvin, Justin P. Kinney, Jacob G. Bernstein, Nancy Kopell, Ed S. Boyden

Poster Session 2

#21 Cognitive Strategies and Neural Correlates of Hierarchical Latent Inference
D. McNamee, J. Gläscher, P. Bossaerts, J. P. O'Doherty

#22 Getting Ready to Stop: Neural Correlates of a Bayesian Belief and Its Motor Consequence
Sien Hu, Jaime Ide, Sheng Zhang, C.-S. Ray Li

#23 Involvement of the Vibrissae in Sensing Fluid Flow
Y.S.W. Yu, M.M. Graff, P.R. Jones, Y.B. Man, A.E. Beverage, D.J. Cesta, N.A. Patankar, V. Gopal, M.J.Z. Hartmann

#24 A Comprehensive Neuromechanical Model of Spinal Control of Locomotion: Experimental Model Verification and Testing Model Predictions
Boris I. Prilutsky, Sergey N. Markin, Alexander N. Klishko, Natalia A. Shevtsova, Ilya A. Rybak, Michel A. Lemay
#25 Long Term Reactivation in Hippocampus: Experimental Evidence and Information Geometric Approach
Jean-Marc Fellous, Masami Tatsuno

#26 Potential of IVIM MRI as a Cerebral Microvascular Biomarker
Gabrielle Fournet, Alexander M. Cerjanic, Jing-Rebecca Li, Denis Le Bihan, Bradley Sutton, Luisa Ciobanu

#27 A Point Process Filter to Estimate Optimal Placement of DBS Electrodes in the Subthalamic Nucleus
Uri Eden

#28 Modeling the Relationship between Extracranial and Intracranial K-complexes in Humans
Eric Halgren, Donald Hagler, Sergey Gratry, Istvan Ulbert, Rachel A. Mak-McCully, Nima Dehghani, Matthieu Rolland, Joseph Madsen, Sydney S. Cash

#29 Organization of Left-right Coordination of Neuronal Activity in the Mammalian Spinal Cord Locomotor CPG: Insights from Computational Modeling
Ilya A Rybak, Ronald M Harris-Warrick, Ole Kiehn

#30 Robust Inference for Nonstationary Spike Trains
Matthew Harrison, Asohan Amarasingham

#31 A Common High-dimensional Linear Model of Representational Spaces in Human Cortex
James Haxby

#32 Active Acoustic Sensing: Representing Space through Sound
Cynthia F. Moss, Melville Wohlgemuth, Ninad B. Kothari, Timothy K. Horiuchi

#33 Optimal Prediction of Moving Sound Source Direction in the Owl
Brian J Fischer, Weston Cox

#34 Time-domain Multiplexing of Multiple Items in an Auditory Coding Bottleneck
J.M. Groh, V.C. Caruso, J.A. Lee, D. Pages, S. Tokdar

#35 Structured Patterns of Dendritic Inhibition Revealed by Array Tomography
Erik Bloss, Jennifer Colonell, Bill Karsh, William Kath, Richard Fetter, Nelson Spruston

#36 Fully-automated Multi-objective Optimization for Fitting a Realistic Neuron Model to Experimental Data
Aushra Abouzeid, Nelson Spruston, William L. Kath

#37 Hippocampal Spine Head Sizes are Highly Precise
Thomas M Bartol, Cailey Bromer, Justin Kinney, Kristen Harris, Terry Sejnowski
#38 The Contribution of Active Dendritic Properties to Temporal Integration in a Network
Melanie M. Lee, Emre R.F. Aksay, Mark S. Goldman

#39 Beyond the Single Cycle: Alterations in Neuronal Properties and Input/Output Functions Lasting throughout the Theta Network State
Giovanni Talei Franzesi, Annabelle C. Singer, Suhasa B. Kodadaramaiah, Christoph Borgers, Nancy Kopell, Edward S. Boyden

#40 Effects of General Anesthetics on Somatosensory Cortical Neurons
Francisco J. Flores, Suhasa B. Kodandaramaiah, Ian R. Wickersham, Gregory Holst, Giovanni Talei-Franzesi, Annabelle S. Singer, Nancy Kopell, Christoph Borgers, Craig Forest, Emery N. Brown, Edward S. Boyden

#41 Assistive Respiratory Pacing of the Diaphragm in the Rat Model Based on Ventilatory and Electromyographic Recordings
Ricardo Siu, Brian Hillen, Brett Davis, Adeline Zbrzeski, Yannick Bornat, Jonathan Castelli, James Abbas, Sylvie Renaud, Ranu Jung

#42 Mechanisms of Interneuronal Control of Spontaneous Oscillations in a Full-scale Parallel Computer Model of the CA1 Network
Marianne Bezaire, Kelly Burk, Ivan Soltesz

#43 The Distribution of Octopamine and Tyramine and their Receptors in the Honey Bee Brain
Irina Sinakevitch, Brian H. Smith