

Curriculum Vitae (.pdf)

Liam Paninski

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Current position

Professor, Departments of Statistics and Neuroscience, Center for Theoretical Neuroscience, Doctoral Program in Neurobiology and Behavior, Zuckerman Mind Brain Behavior Institute, and Kavli Institute for Brain Science, Columbia University.

Co-director, Grossman Center for the Statistics of Mind.

Co-director, Columbia NeuroTechnology Center.

Education

New York University; Ph.D., Neural Science (2003).

Brown University; B.S., Neuroscience (1999).

Previous experience

Assistant (2005-8) and Associate (2008-13) Professor, Department of Statistics, Columbia University.

Senior research fellow, Gatsby Computational Neuroscience Unit, University College London (2004-5).

Postdoctoral fellow, Center for Neural Science, HHMI, NYU (2003).

Papers

Sun, R. and Paninski, L. (2018). Scalable approximate Bayesian inference for particle tracking data. *Biorxiv* 276253.

Zhou, P. et al (2018). Efficient and accurate extraction of in vivo calcium signals from microendoscopic video data. *eLife*.

Jimenez, J. et al (2018). Anxiety cells in a hippocampal-hypothalamic circuit. *Neuron* 97: 670-683.

Berens et al (2017+). Community-based benchmarking improves spike inference from two-photon calcium imaging data. *Biorxiv* 177956.

Linderman, S., Mena, G. et al (2017+). Reparameterizing the Birkhoff Polytope for Variational Permutation Inference. *arXiv* 1710.09508 / AISTATS 2018.

International Brain Lab (2017). An international laboratory for systems and computational neuroscience. *Neuron* 96: 1213-1218.

Yu et al (2017). The central amygdala controls learning in the lateral amygdala. *Nature Neuroscience* 20: 1680-1685.

Klaus et al (2017). The spatiotemporal organization of the striatum encodes action space. *Neuron* 95: 1171-1180.

Giovanucci, A. et al (2017). OnACID: Online Analysis of Calcium Imaging Data in Real Time. *NIPS*.

Parthasarathy, N., Batty, E. et al (2017). Deep Networks for Decoding Natural Images from Retinal Signals. *Biorxiv* 153759 / *NIPS*.

Lee, J. et al (2017). YASS: Yet another spike sorter. *Biorxiv* 151928 / *NIPS*.

Giovanucci et al (2017). Cerebellar granule cells acquire a widespread feedback control signal during motor learning. *Nature Neuroscience* 20: 727-734.

Buesing et al (2017). A Statistical Model of Shared Variability in the Songbird Auditory System. *bioRxiv* 113670.

Friedrich, J. et al (2017). Multi-scale approaches for high-speed imaging and analysis of large neural populations. *PLoS Comp. Bio.* 13: e1005685.

- Mena, G. et al (2017). Removing Stimulation Artifacts From Neural Recordings Using Structured Gaussian Processes. bioRxiv 089912; in press, PLoS Comp. Bio.
- Batty, E. et al (2017). Multilayer Network Models of Primate Retinal Ganglion Cells. ICLR.
- Sun, R., Archer, E. & Paninski, L. (2017). Variational inference for super resolution microscopy. AISTATS17 / bioRxiv 081703.
- Linderman, S., Miller, A., Adams, R., Blei, D., Paninski, L., Johnson, M. (2017). Recurrent Switching Linear Dynamical Systems. AISTATS17 / ArXiv 1610.08466.
- Pakman, A., Gilboa, D., Carlson, D. & Paninski, L. (2017). Stochastic Bouncy Particle Sampler. ICML17 / Arxiv 1609.00770.
- Rahnama Rad, K., Machado, T. & Paninski, L. (2017). Robust and scalable Bayesian analysis of spatial neural tuning function data. In press, Ann. Applied Stat., Arxiv 1606.07845
- Sumbul, U., Roossien, D., Chen, F., Barry, N., Boyden, E., Cai, D., Cunningham, J. & Paninski, L. (2016). Automated scalable segmentation of neurons from multispectral images. NIPS; Arxiv 1611.00388.
- Archer, E., Gao, Y., Paninski, L. & Cunningham, J. (2016). Latent linear-dynamical neural population models through nonlinear embedding. NIPS; Arxiv 1605.08454.
- Friedrich, J., Zhou, P. & Paninski, L. (2016). Fast Active Set Method for Online Spike Inference from Calcium Imaging. NIPS; PLoS Comput. Bio. 13: e1005423.
- Merel, J., Shababo, B., Naka, A., Adesnik, H. & Paninski, L. (2016). Bayesian methods for event analysis of intracellular currents. Journal of Neuroscience Methods 269: 21-32.
- Merel, J., Carlson, D., Paninski, L. & Cunningham, J. (2016). Neuroprosthetic decoder training as imitation learning. PLoS Comp. Bio 12: e1004948.
- Carlson, D., Stinson, P., Pakman, A. & Paninski, L. (2016). Partition Functions from Rao-Blackwellized Tempered Sampling. ICML.
- Picardo, M., Merel, J., Katlowitz, K., Vallentin, D., Okobi, D., Benezra, S., Clary, R., Pnevmatikakis, E., Paninski, L., and Long, M. (2016). Population-level representation of a temporal sequence underlying skilled behavior. Neuron 90: 866-876.
- Gabitto M., Pakman A., Bikoff J., Abbott L., Jessell T. & Paninski, L. (2016). Bayesian sparse regression analysis reveals the extent of spinal V1 interneuron diversity. Cell, 165: 220-33.
- Pnevmatikakis, E., Soudry, D., Gao, Y., Machado, T., Merel, J., Pfau, D., Reardon, T., Mu, Y., Lacefield, C., Yang, W., Ahrens, M., Bruno, R., Jessell, T., Yuste, R., Peterka, D. & Paninski, L. (2016). Simultaneous denoising, deconvolution, and demixing of calcium imaging data. Neuron 89: 285-299.
- Yang, W., Miller, J., Carillo-Reid, L. Pnevmatikakis, E., Paninski, L., Yuste, R., & Peterka, D. (2016). Simultaneous multi-plane imaging of neural circuits. Neuron 89: 269-84.
- Archer, E., Park, M., Buesing, L., Cunningham, J. & Paninski, L. (2015). Black-box variational inference for state-space models. arXiv:1511.07367
- Freeman, J., Field, G., Li, P., Greschner, M., Gunning, D., Mathieson, K., Sher, A., Litke, A., Paninski, L., Simoncelli, E. & Chichilnisky, E.J. (2015). Mapping nonlinear receptive field structure in primate retina at single cone resolution. eLife 4:e05241.
- Soudry, D., Keshri, S., Stinson, P., Oh, M.-W., Iyengar, G. & Paninski, L. (2015). Efficient “shotgun” inference of neural connectivity from highly sub-sampled activity data. PLoS Comp. Bio. 11: e1004464.
- Machado, T., Miri, A., Pnevmatikakis, E., Paninski, L. & Jessell, T. (2015). Primacy of flexor locomotor pattern revealed by ancestral reversion of motor neuron identity. Cell 162: 338-350.
- Merel, J., Pianto, D., Cunningham, J. & Paninski, L. (2015). Encoder-decoder optimization for brain-computer interfaces. PLoS Comp. Bio 11: e1004288.

- Buesing, L., Machado, T., Cunningham, J. & Paninski, L. (2014). Clustered factor analysis of multineuronal spike data. NIPS.
- Ramirez, A., Pnevmatikakis, E., Merel, J., Miller, K., Paninski, L. & Bruno, R. (2014). Spatiotemporal receptive fields of barrel cortex neurons revealed by reverse correlation of synaptic input. *Nat. Neurosci.* 17: 866-75.
- Mena, G. & Paninski, L. (2014). On quadrature methods for refractory point process likelihoods. *Neural Computation* 26: 2790-7.
- Pnevmatikakis, E., Merel, J., Pakman, A. & Paninski, L. (2014). Bayesian spike inference from calcium imaging data. *Asilomar Conf. on Signals, Systems, and Computers*.
- Pakman, A., Huggins, J., Smith, C. & Paninski, L. (2014). Fast penalized state-space methods for inferring dendritic synaptic connectivity. *J. Comput. Neurosci.* 36: 415-43
- Ramirez, A. & Paninski, L. (2014). Fast generalized linear model estimation via expected log-likelihoods. *J. Comput. Neurosci.* 36: 215-34.
- Shababo, B., Paige, B., Pakman, A. & Paninski, L. (2013). Bayesian inference and online experimental design for mapping neural microcircuits. NIPS.
- Pnevmatikakis, E. and Paninski, L. (2013). Sparse nonnegative deconvolution for compressive calcium imaging: algorithms and phase transitions. NIPS.
- Pfau, D., Pnevmatikakis, E. & Paninski, L. (2013). Robust learning of low-dimensional dynamics from large neural ensembles. NIPS.
- Pakman, A. and Paninski, L. (2013). Auxiliary-variable exact Hamiltonian Monte Carlo samplers for binary distributions. NIPS.
- Merel, J., Fox, R., Jebara, T. & Paninski, L. (2013). A multi-agent control framework for co-adaptation in brain-computer interfaces. NIPS.
- Smith, C. & Paninski, L. (2013). Computing loss of efficiency in optimal Bayesian decoders given noisy or incomplete spike trains. *Network: Computation in Neural Systems* 24: 75-98.
- Pakman, A. & Paninski, L. (2013). Efficient multivariate truncated normal sampling via exact Hamiltonian Monte Carlo. *J. Comput. Graph. Stat.* 23.
- Pnevmatikakis, E., Rahnema Rad, K., Huggins, J., & Paninski, L. (2013). Fast Kalman filtering and forward-backward smoothing via a low-rank perturbative approach. *J. Comput. Graph. Stat.* 23.
- Sadeghi et al. (2013). Monte Carlo methods for localization of cones given multielectrode retinal ganglion cell recordings. *Network: Computation in Neural Systems* 24: 27-51.
- Doi et al. (2012). Efficient coding of spatial information in the primate retina. *Journal of Neuroscience* 32: 16256-16264.
- Pnevmatikakis, E., Kelleher, K., Chen, R., Josic, K., Saggau, P. & Paninski, L. (2012). Fast nonnegative spatiotemporal calcium smoothing in dendritic trees. *PLoS Comp. Bio.* 8: e1002569.
- Paninski, L., Rahnema Rad, K. & Vidne, M. (2012). Robust particle filters via sequential pairwise reparameterized Gibbs sampling. *CISS '12*.
- Mishchenko, Y. & Paninski, L. (2012) Bayesian compressed sensing approach to reconstructing neural connectivity from subsampled anatomical data. *J. Comput. Neuro.* 33: 371-88.
- Pnevmatikakis & Paninski, L. (2012). Fast interior-point inference in high-dimensional sparse, penalized state-space models. *AISTATS '12*.
- Smith, C., Wood, F. & Paninski, L. (2012). Low rank continuous-space graphical models. *AISTATS '12*.

- Vidne et al. (2012). The impact of common noise on the activity of a large network of retinal ganglion cells. *J. Comput. Neuro.* 33: 97-121.
- Paninski, L., Vidne, M., DePasquale, B., & Ferreira, D. (2012). Inferring synaptic inputs given a noisy voltage trace. *J. Comput. Neuro.* 33: 1-19.
- Huggins, J. & Paninski, L. (2012). Optimal experimental design for sampling voltage on dendritic trees. *J. Comput. Neuro.* 32: 347-66.
- Nazarpour, K., Ethier, C., Paninski, L., Rebesco, J., Miall, C., & Miller, L. (2011). EMG prediction from motor cortical recordings via a non-negative point process filter. *IEEE Transactions on Biomedical Engineering* 59: 1829-1838.
- Rahnama Rad, K. & Paninski, L. (2011). Information rates and optimal decoding in large neural populations. *NIPS*.
- Mishchenko, Y. & Paninski, L. (2011). Efficient methods for sampling spike trains in networks of coupled neurons. *Annals of Applied Statistics* 5: 1893-1919.
- Ahmadian, Y., Packer, A., Yuste, R. & Paninski, L. (2011). Designing optimal stimuli to control neuronal spike timing. *J. Neurophys.* 106: 1038-1053.
- Butts, D., Weng, C., Jin, J. Alonso, J.-M. & Paninski, L. (2011). Temporal precision in the visual pathway through the interplay of excitation and stimulus-driven suppression *J. Neurosci.* 31: 11313-11327.
- Mishchenko, Y., Vogelstein, J. & Paninski, L. (2011). A Bayesian approach for inferring neuronal connectivity from calcium fluorescent imaging data. *Annals of Applied Statistics* 5: 1229-1261.
- Ramirez, A., Ahmadian, Y., Schumacher, J., Schneider, D., Woolley, S. & Paninski, L. (2011). Incorporating naturalistic correlation structure improves spectrogram reconstruction from neuronal activity in the songbird auditory midbrain. *J. Neurosci.* 31: 3828-42.
- Escola, S., Fontanini, A., Katz, D. & Paninski, L. (2011). Hidden Markov models for the inference of neural states and improved estimation of linear receptive fields. *Neural Computation* 23: 1071-1132.
- Calabrese, A. & Paninski, L. (2011). Kalman filter mixture model for spike sorting of non-stationary data. *J. Neurosci. Methods* 196: 159-169.
- Calabrese, A., Schumacher, J., Schneider, D., Woolley, S. & Paninski, L. (2011). A penalized GLM approach for estimating spectrotemporal receptive fields from responses to natural sounds. *PLoS One* 6(1): e16104.
- Lewi, J., Schneider, D., Woolley, S. & Paninski, L. (2011). Automating the design of informative sequences of sensory stimuli. *Journal of Computational Neuroscience* 30: 181-200 (special issue on methods of information theory in neuroscience research).
- Ahmadian, Y., Pillow, J. & Paninski, L. (2011). Efficient Markov Chain Monte Carlo methods for decoding population spike trains. *Neural Computation* 23: 46-96.
- Pillow, J., Ahmadian, Y. & Paninski, L. (2011). Model-based decoding, information estimation, and change-point detection in multi-neuron spike trains. *Neural Computation* 23: 1-45.
- Vogelstein, J., Packer, A., Machado, T., Sippy, T., Babadi, B., Yuste, R. & Paninski, L. (2010). Fast non-negative deconvolution for spike train inference from calcium imaging. *J. Neurophys.* 104: 3691-3704
- Field, G., Gauthier, J., Sher, A. et al. (2010). Functional connectivity in the retina at the resolution of photoreceptors. *Nature* 467, 673-677.
- Rahnama Rad, K. & Paninski, L. (2010). Efficient estimation of two-dimensional firing rate surfaces via Gaussian process methods. *Network: Computation in Neural Systems* 21: 142-68.

- Paninski, L., Ahmadian, Y., Ferreira, D., Koyama, S., Rahnama, K., Vidne, M., Vogelstein, J. & Wu, W. (2010). A new look at state-space models for neural data. *Journal of Computational Neuroscience* (special issue on statistical analysis of neural data) 29: 107-126.
- Koyama, S. & Paninski, L. (2010). Efficient computation of the most likely path in integrate-and-fire and more general state-space models. *Journal of Computational Neuroscience* 29: 89-105.
- Lawhern, V., Wu, W., Hatsopoulos, N. & Paninski, L. (2010). Population neuronal decoding using a generalized linear model with hidden states. *J. Neurosci. Methods* 189: 267-280.
- Babadi, B., Casti, A., Xiao, Y. & Paninski, L. (2010). A generalized linear model of the impact of direct and indirect inputs to the lateral geniculate nucleus. *Journal of Vision* 10: 22.
- Field, R., Lary, J., Cohn, J., Paninski, L. & Shepard, K. (2010). A low-noise, single-photon avalanche diode in standard 0.13 micron complementary metal-oxide-semiconductor process. *Applied Physics Letters* 97, 211111.
- Paninski, L. (2010). Fast Kalman filtering on quasilinear dendritic trees. *Journal of Computational Neuroscience* 28: 211-28.
- Lalor, E., Ahmadian, Y. & Paninski, L. (2009). The relationship between optimal and biologically plausible decoding of stimulus velocity in the retina. *Journal of the Optical Society of America A* (special issue on ideal observers and efficiency) 26: B25-42.
- Vogelstein, J., Watson, B., Packer, A., Yuste, R., Jedynak, B. & Paninski, L. (2009). Spike inference from calcium imaging using sequential Monte Carlo methods. *Biophysical Journal* 97: 636-655.
- Wu, W., Kulkarni, J., Hatsopoulos, N. & Paninski, L. (2009). Neural decoding of goal-directed movements using a linear state-space model with hidden states. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 17: 370-378.
- Escola, S., Eisele, M., Miller, K. & Paninski, L. (2009). Maximally reliable Markov chains under energy constraints. *Neural Computation* 21: 1863-912.
- Toyoizumi, T., Rahnama Rad, K. & Paninski, L. (2009). Mean-field approximations for coupled populations of generalized linear model spiking neurons. *Neural Computation* 21, 1203-1243.
- Huys, Q. & Paninski, L. (2009). Smoothing of, and parameter estimation from, noisy biophysical recordings. *PLOS Computational Biology* 5: e1000379.
- Lewi, J., Butera, R. & Paninski, L. (2009). Sequential optimal design of neurophysiology experiments. *Neural Computation* 21: 619-687.
- Fudenberg, G. Paninski, L. (2009). Bayesian image recovery for low-SNR dendritic structures. *IEEE Trans. Image Processing* 18: 471-482.
- Lewi, J., Butera, R., Schneider, D., Woolley, S. & Paninski, L. (2008). Designing neurophysiology experiments to optimally constrain receptive field models along parametric submanifolds. *NIPS*.
- Paninski, L. (2008). A coincidence-based test for uniformity given very sparsely-sampled discrete data. *IEEE Transactions on Information Theory* 54: 4750-4755.
- Pillow, J., Shlens, J., Paninski, L., Sher, A., Litke, A., Chichilnisky, E. & Simoncelli, E. (2008). Spatiotemporal correlations and visual signaling in a complete neuronal population. *Nature* 454: 995-999.
- Paninski, L. & Yajima, M. (2008). Undersmoothed kernel entropy estimators. *IEEE Transactions on Information Theory* 54: 4384-4388.
- Kulkarni, J. & Paninski, L. (2008). Efficient analytic computational methods for state-space decoding of goal-directed movements. *IEEE Signal Processing Magazine* 25 (special issue on brain-computer interfaces): 78-86.

- Ahrens, M., Paninski, L. & Sahani, M. (2008). Inferring input nonlinearities in neural encoding models. *Network: Computation in Neural Systems* 19: 35-67.
- Paninski, L., Haith, A. & Szirtes, G. (2008). Differentiable integral equation methods for computing likelihoods in the stochastic integrate-and-fire model. *J. Comput. Neuroscience* 24: 69-79.
- Kulkarni, J. & Paninski, L. (2007). Common-input models for multiple neural spike train data. *Network: Computation in Neural Systems* 18: 375-407.
- Lewi, J., Butera, R. & Paninski, L. (2007). Efficient active learning with generalized linear models. *Artificial Intelligence and Statistics (AISTATS)* 11.
- Townsend, B., Paninski, L. & Lemon, R. (2006). Linear encoding of muscle activity in primary motor cortex and cerebellum. *J. Neurophys.* 96: 2578-92.
- Huys, Q., Ahrens, M. & Paninski, L. (2006). Efficient estimation of detailed single-neuron models. *Journal of Neurophysiology* 96: 872-890.
- Paninski, L. (2006). The spike-triggered average of the integrate-and-fire cell driven by Gaussian white noise. *Neural Computation* 18: 2592-2616.
- Paninski, L. (2006). The most likely voltage path and large deviations approximations for integrate-and-fire neurons. *Journal of Computational Neuroscience* 21: 71-87.
- Pillow, J., Paninski, L., Uzzell, V., Simoncelli, E. & Chichilnisky, E. (2005). Structure and precision of retinal responses analyzed with a noisy integrate-and-fire model. *J. Neurosci.* 25: 11003-13.
- Paninski, L. (2005). Inferring prior probabilities from Bayes-optimal behavior. *Advances in Neural Information Processing* 18.
- Shoham, S., Paninski, L., Fellows, M., Hatsopoulos, N., Donoghue, J. & Normann, R. (2005). Optimal decoding for a primary motor cortical brain-computer interface. *IEEE Transactions on Biomedical Engineering* 52: 1312-1322.
- Paninski, L. (2005). Asymptotic theory of information-theoretic experimental design. *Neural Computation* 17: 1480-1507.
- Paninski, L. (2004). Log-concavity results on Gaussian process methods for supervised and unsupervised learning. *Advances in Neural Information Processing* 17.
- Paninski, L. (2004). Variational minimax estimation of discrete distributions under Kullback-Leibler loss. *Advances in Neural Information Processing* 17.
- Paninski, L. (2004). Maximum likelihood estimation of cascade point-process neural encoding models. *Network: Computation in Neural Systems* 15: 243-262.
- Paninski, L., Pillow, J. & Simoncelli, E. (2004). Comparing integrate-and-fire-like models estimated using intra- and extra-cellular data. *Neurocomputing* 65: 379-385.
- Paninski, L., Pillow, J. & Simoncelli, E. (2004). Maximum likelihood estimation of a stochastic integrate-and-fire neural encoding model. *Neural Computation* 16: 2533-2561.
- Paninski, L. et al. (2004). Superlinear population encoding of dynamic hand trajectory in primary motor cortex. *Journal of Neuroscience* 24: 8551-8561.
- Paninski, L. (2004). Estimating entropy on m bins given fewer than m samples. *IEEE Transactions on Information Theory* 50: 2200-2203.
- Paninski, L., Fellows, M., Hatsopoulos, N. & Donoghue, J. (2004). Spatiotemporal tuning properties for hand position and velocity in motor cortical neurons. *Journal of Neurophysiology* 91: 515-532.
- Hatsopoulos, N., Paninski, L. & Donoghue, J. (2003). Sequential movement representations based on correlated neuronal activity. *Experimental Brain Research* 149: 478-486.

Serruya, M., Hatsopoulos, N., Paninski, L., Fellows, M. & Donoghue, J. (2003). Robustness of neuroprosthetic decoding algorithms. *Biological Cybernetics* 88: 219-228.

Paninski, L. (2003). Estimation of entropy and mutual information. *Neural Comp.* 15: 1191-1253.

Paninski, L. (2003). Convergence properties of three spike-triggered analysis techniques. *Network: Computation in Neural Systems* 14: 437-464. (Special issue on natural scene statistics and neural codes.)

Paninski, L., Lau, B. & Reyes, A. (2003). Noise-driven adaptation: *in vitro* and mathematical analysis. *Neurocomputing* 52: 877-883.

Serruya, M., Hatsopoulos, N., Paninski, L., Fellows, M. & Donoghue, J. (2002). Instant neural control of a movement signal. *Nature* 416: 141-142.

Paninski, L. & Hawken, M. (2001). Stochastic optimal control and the human oculomotor system. *Neurocomputing*, 38-40: 1511-1517.

Hatsopoulos, N., Ojakangas, C., Paninski, L. & Donoghue, J. (1998). Information about movement direction obtained from synchronous activity of motor cortical neurons. *PNAS* 95: 15706-11.

Books

Paninski, L., Eden, U., Brown, E. & Kass, R. *Statistical analysis of neurophysiological data*. Under contract, Springer.

Gerstner, W., Kistler, W., Naud, R. & Paninski, L. (2014). *Neuronal dynamics*. Cambridge U. Press.

Invited reviews / book chapters

International Brain Laboratory (2017). An International Laboratory for Systems and Computational Neuroscience. *NeuroView, Neuron* 96: 1213-1218.

Paninski, L. & Cunningham, J. (2017). Neural data science: accelerating the experiment-analysis-theory cycle in large-scale neuroscience. Invited review, *Current Opinion in Neurobiology*; *BioRxiv* 196949.

Yuste, R., Watson, B., Paninski, L., Vogelstein, J. (2009). Imaging action potentials with calcium indicators. *Imaging Neurons: A Laboratory Manual*, 2ed., eds. Yuste, R. & Konnerth, A., CSHL Press.

Paninski, L., Kass, R., Brown, E. & Iyengar, I. (2008). Statistical analysis of neuronal data via integrate-and-fire models. *Stochastic Methods in Neuroscience*, eds. Laing, C. & Lord, G., Oxford.

Paninski, L., Pillow, J. & Lewi, J. (2007). Statistical models for neural encoding, decoding, and optimal stimulus design. *Computational Neuroscience: Progress in Brain Research*, eds. Cisek, P., Drew, T. & Kalaska, J.

Simoncelli, E., Paninski, L., Pillow, J. & Schwartz, O. (2004). Characterization of neural responses with stochastic stimuli. Chapter 23 of *The New Cognitive Neurosciences*, 3ed, ed. Gazzaniga, M..

Grants

Collaborative Research in Computational Neuroscience, NEI R01 EY018003, co-PI w/ E. Simoncelli and E.J. Chichilnisky, 2006-12.

Gatsby Initiative in Brain Circuitry Pilot Grant, co-PI w/ S. Woolley, 2006-8.

Alfred P. Sloan Research Fellowship, 2007.

NSF Faculty Early Career Development (CAREER) IOS-0641912, 2007-12

McKnight Scholar award, 2008-12.

Collaborative Research in Comput. Neuroscience, NSF IIS-0904353, co-PI w/ R. Yuste, 2009-12.

DARPA award, Reliable Neural-interface Technology program, co-PI w/ B. Pesaran, 2011-3.

MURI award, "Imaging how a neuron computes," co-PI w/ R. Yuste et al., 2012-.

ONR award, Generalized Factor Analysis, Exact Hamiltonian Monte Carlo Methods, and Spike-and-

Slab Models for Non-Gaussian Multivariate Analysis, 2014-.

Collaborative Research in Comput. Neuroscience, NSF IIS-1430239 (Simoncelli and Chichilnisky, co-PIs), 2014-.

Simons Global Brain Research Awards (4) with M. Long, M. Ahrens, J. Freeman, L. Abbott, J. Cunningham, M. Churchland, S. Fusi, W. Freiwald, 2014-.

DARPA SIMPLEX program (Blei, Yuste, Jebara co-PIs), 2015-7.

IARPA MICrONS program (multiple co-PIs), 2015-.

NSF BIGDATA: Collaborative Research: IA: Hardware and software for spike detection and sorting in massively parallel electrophysiological recording systems for the brain (multiple co-PIs), 2015-.

Google Faculty Award, 2015.

NIH BRAIN Initiative R01 EB22913: Next-Generation Calcium Imaging Analysis Methods, 2016-.

NIH BRAIN Initiative R21 EY027592: Optimal calcium imaging with shaped excitation, co-PI D. Peterka, 2016-.

DARPA NESD program (multiple co-PIs), 2016-.

NIH BRAIN Initiative 1U01NS103489-01: High-speed volumetric imaging of neural activity throughout the living brain, co-PI N. Ji et al, 2017-.

International Brain Lab (multiple co-PIs), 2017-.

NSF Neuronex (multiple co-PIs), 2017-.

NIH BRAIN Initiative U19 Team: Computational and circuit mechanisms underlying motor control (multiple co-PIs), 2017-.

Advising

Postdoctoral research advisor: J. Kulkarni, Q. Huys, Y. Ahmadian, Y. Mishchenko, L. Badel, E. Pnevmatikakis, K. Sadeghi, A. Pakman, D. Pianto, L. Buesing, D. Soudry, U. Sumbul, E. Archer, A. Dubbs, J. Friedrich, L. Grosenick, D. Carlson, X. Deng, X. Wei, S. Chen, D. Hernandez, P. Zhou, S. Saxena

Ph.D. research advisor: S. Escola, J. Vogelstein, J. Lewi, M. Nikitchenko, K. Rahnama Rad, M. Vidne, A. Ramirez, D. Ferreira, A. Calabrese, C. Smith, T. Machado, D. Pfau, J. Merel, G. Mena, E. Batty, R. Sun, P. Stinson, J. Lee, H. Razaghi.

M.A. research advisor: M. Yajima, C. Gohil, J. Bahk, W. Yao, N. Dethe, E.K. Buchanan

Undergraduate research advisor: G. Fudenberg, J. Huggins, A. Qian, T. Rutten, W. Falcon, S. Wu.

Other duties

Mindscope advisory council, Allen Institute for Brain Science

Scientific advisor board, CTRL-Labs