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Academic Positions

GATSBY COMPUTATIONAL NEUROSCIENCE UNIT, UNIVERSITY COLLEGE, LONDON	
Professor of Theoretical Neuroscience and Machine Learning	10/13 –
Reader (Associate Professor)	10/09 – 9/13
Lecturer (Assistant Professor)	5/04 – 9/09
DEPT. OF ELECTRICAL ENGINEERING, STANFORD UNIVERSITY, STANFORD, CALIFORNIA	
Visiting Associate Professor	8/10 –
Visiting Assistant Professor	8/04 – 7/10
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, CALIFORNIA	
Postdoctoral Fellow	8/02 – 4/04
GATSBY COMPUTATIONAL NEUROSCIENCE UNIT, UNIVERSITY COLLEGE, LONDON	
Senior Research Fellow	6/99 – 8/02

Education

CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CALIFORNIA	
Ph.D. Computation and Neural Systems	5/99
Dissertation: Latent Variable Models for Neural Data Analysis. Advisors: R. A. Andersen and J. J. Hopfield.	
B.S. Physics	6/93

Selected Professional Activities

General Chair, Computational and Systems Neuroscience Conference (COSYNE).	10
Programme Chair, COSYNE.	09
Workshops Chair, Neural Information Processing Systems (NIPS).	08
Programme Committee, COSYNE.	07
Programme Committee, NIPS.	04, 06
Member, Board of Directors of the Computational Neuroscience Organization.	03 – 06
Workshops Chair, Computational Neuroscience Meeting.	99 – 03
Co-organizer, Workshop on Neural Dynamics, Gatsby Unit, University College London.	00
Member, Society for Neuroscience.	95 –
Member, Association for Research in Otolaryngology.	05 –
Member, IEEE.	10 –
Editorial boards: Neural Systems and Circuits; Network: Computation in Neural Systems	
Advisory or Scientific boards: COSYNE; Workshops on Computational Audition	

Publications

- K. V. Shenoy, M. Sahani, and M. M. Churchland. Cortical control of arm movements: A dynamical systems perspective. *Annual Review of Neuroscience*, 36:337–359, 2013.
- M. I. Garrido, M. Sahani*, and R. J. Dolan*. Outlier responses reflect sensitivity to statistical structure in the human brain. *PLoS Computational Biology*, 9(3):e1002999, 2013. * equal contributions.
- L. Buesing, J. H. Macke, and M. Sahani. Learning stable, regularised latent models of neural population dynamics. *Network: Computation in Neural Systems*, 23(1–2):24–47, 2012.
- L. Buesing, J. H. Macke, and M. Sahani. Spectral learning of linear dynamics from generalised-linear observations with application to neural population data. In P. Bartlett, F. C. N. Pereira, L. Bottou, C. J. C. Burges, and K. Q. Weinberger, eds., *Advances in Neural Information Processing Systems*, vol. 25, 2012.
- M. I. Garrido, G. R. Barnes, M. Sahani, and R. J. Dolan. Functional evidence for a dual route to amygdala. *Current Biology*, 22(2):129–134, 2012.
- G. Mysore and M. Sahani. Variational inference in non-negative factorial hidden Markov models for efficient audio source separation. In *ICML 2012: Proceeding, Twenty-Ninth International Conference on Machine Learning*, Madison, WI, 2012. Omnipress.
- M. Pachitariu and M. Sahani. Learning visual motion in recurrent neural networks. In P. Bartlett, F. C. N. Pereira, L. Bottou, C. J. C. Burges, and K. Q. Weinberger, eds., *Advances in Neural Information Processing Systems*, vol. 25, 2012.
- R. E. Turner and M. Sahani. Decomposing signals into a sum of amplitude and frequency modulated sinusoids using probabilistic inference. In *ICASSP'12: Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2012.
- L. Whiteley and M. Sahani. Attention in a Bayesian framework. *Frontiers in Human Neuroscience*, 6:100, 2012.
- M. B. Ahrens and M. Sahani. Observers exploit stochastic models of sensory change to help judge the passage of time. *Current Biology*, 21(3):200–206, 2011.
- A. Afshar, G. Santhanam, B. M. Yu, S. I. Ryu, M. Sahani*, and K. V. Shenoy*. Single-trial neural correlates of arm movement preparation. *Neuron*, 71(3):555–564, 2011. * equal contributions.
- G. B. Christianson, M. Sahani, and J. F. Linden. Depth-dependent temporal response properties in core auditory cortex. *Journal of Neuroscience*, 31(36):12837–12848, 2011.
- M. I. Garrido, R. J. Dolan, and M. Sahani. Surprise leads to noisier perceptual decisions. *i-Perception*, 2(2):112–120, 2011.
- J. H. Macke, L. Büsing, J. P. Cunningham, B. M. Yu, K. V. Shenoy, and M. Sahani. Empirical models of spiking in neural populations. In J. Shawe-Taylor, R. S. Zemel, P. Bartlett, F. C. N. Pereira, and K. Q. Weinberger, eds., *Advances in Neural Information Processing Systems*, vol. 24, pp. 1350–1358, Red Hook, New York, 2011. Curran Associates, Inc.
- B. Petreska, B. M. Yu, J. P. Cunningham, G. Santhanam, S. I. Ryu, K. V. Shenoy, and M. Sahani. Dynamical segmentation of single trials from population neural data. In J. Shawe-Taylor, R. S. Zemel, P. Bartlett, F. C. N. Pereira, and K. Q. Weinberger, eds., *Advances in Neural Information Processing Systems*, vol. 24, pp. 756–764, Red Hook, New York, 2011. Curran Associates, Inc.
- M. Sahani and L. Whiteley. Modeling cue integration in cluttered environments. In M. Landy, K. Körding, and J. Trommershäuser, eds., *Sensory Cue Integration*. Oxford University Press, 2011.
- K. V. Shenoy, M. T. Kaufman, M. Sahani, and M. M. Churchland. A dynamical systems view of motor preparation: Implications for neural prosthetic system design. In A. Green, E. Chapman, J. F. Kalaska, and F. Lepore, eds., *Progress in Brain Research: Enhancing Performance for Action and Perception*, vol. 192, pp. 33–59. Elsevier, 2011.
- R. E. Turner and M. Sahani. Demodulation as probabilistic inference. *IEEE Transactions on Audio, Speech*

and Language Processing, 19(8):2398–2411, 2011.

R. E. Turner and M. Sahani. Two problems with variational expectation maximisation for time-series models. In D. Barber, A. T. Cemgil, and S. Chiappa, eds., *Bayesian Time Series Models*. Cambridge University Press, 2011.

R. E. Turner and M. Sahani. Probabilistic amplitude and frequency demodulation. In J. Shawe-Taylor, R. S. Zemel, P. Bartlett, F. C. N. Pereira, and K. Q. Weinberger, eds., *Advances in Neural Information Processing Systems*, vol. 24, pp. 981–989, Red Hook, New York, 2011. Curran Associates, Inc.

M. M. Churchland, B. M. Yu, J. P. Cunningham, L. P. Sugrue, M. R. Cohen, G. S. Corrado, W. T. Newsome, A. M. Clark, P. Hosseini, B. B. Scott, D. C. Bradley, M. A. Smith, A. Kohn, J. A. Movshon, K. M. Armstrong, T. Moore, S. W. Chang, L. H. Snyder, S. G. Lisberger, N. J. Priebe, I. M. Finn, D. Ferster, S. I. Ryu, G. Santhanam, M. Sahani, and K. V. Shenoy. Stimulus onset quenches neural variability: a widespread cortical phenomenon. *Nature Neuroscience*, 13(3):369–378, 2010.

B. Englitz, M. Ahrens, S. Tolnai, R. RübSamen, M. Sahani, and J. Jost. Multilinear models of single cell responses in the medial nucleus of the trapezoid body. *Network: Computation in Neural Systems*, 21(1-2):91–124, 2010.

S. Fleming, L. Whiteley, O. J. Hulme, M. Sahani, and R. J. Dolan. Effects of category-specific costs on neural systems for perceptual decision-making. *Journal of Neurophysiology*, 103:3238–3247, 2010.

P. Hehrmann, J. K. Maier, N. S. Harper, D. McAlpine, and M. Sahani. Adaptive coding for auditory spatial cues. In E. A. Lopez-Poveda, R. Meddis, and A. R. Palmer, eds., *The Neurophysiological Bases of Auditory Perception*, pp. 357–366. Springer, New York, 2010.

R. E. Turner and M. Sahani. Statistical inference for single- and multi-band probabilistic amplitude demodulation. In *ICASSP’10: Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2010.

B. M. Yu, G. Santhanam, M. Sahani, and K. V. Shenoy. Neural decoding for motor and communication prostheses. In K. G. Oweiss, ed., *Statistical Signal Processing for Neuroscience*, pp. 219–263. Elsevier, 2010.

J. Lücke, R. E. Turner, M. Sahani, and M. Henniges. Occlusive components analysis. In *Advances in Neural Information Processing Systems*, vol. 22, Red Hook, New York, 2009. Curran Associates, Inc.

P. Berkes, R. E. Turner, and M. Sahani. A structured model of video reproduces primary visual cortical organisation. *PLoS Computational Biology*, 5(9):e1000495, 2009.

G. Santhanam, B. M. Yu, V. Gilja, S. I. Ryu, A. Afshar, M. Sahani, and K. V. Shenoy. Factor-analysis methods for higher-performance neural prostheses. *Journal of Neurophysiology*, 102:1315–1330, 2009.

B. M. Yu, J. P. Cunningham, G. Santhanam, S. I. Ryu, K. V. Shenoy*, and M. Sahani*. Gaussian-process factor analysis for low-dimensional single-trial analysis of neural population activity. *Journal of Neurophysiology*, 102:614–635, 2009. * equal contributions.

B. M. Yu, J. P. Cunningham, G. Santhanam, S. I. Ryu, K. V. Shenoy, and M. Sahani. Gaussian-process factor analysis for low-dimensional single-trial analysis of neural population activity. In D. Koller, D. Schuurmans, Y. Bengio, and L. Bottou, eds., *Advances in Neural Information Processing Systems*, vol. 21, pp. 1881–1888, Red Hook, New York, 2009. Curran Associates, Inc.

M. B. Ahrens, J. F. Linden, and M. Sahani. Nonlinearities and contextual influences in auditory cortical responses modeled with multilinear spectrotemporal methods. *Journal of Neuroscience*, 28(8):1929–1942, 2008.

M. B. Ahrens, L. Paninski, and M. Sahani. Inferring input nonlinearities in neural encoding models. *Network: Computation in Neural Systems*, 19(1):35–67, 2008.

M. B. Ahrens and M. Sahani. Inferring elapsed time from stochastic neural processes. In J. C. Platt, D. Koller, Y. Singer, and S. Roweis, eds., *Advances in Neural Information Processing Systems*, vol. 20, Red Hook, New York, 2008. Curran Associates, Inc.

P. Berkes, R. E. Turner, and M. Sahani. On sparsity and overcompleteness in image models. In J. C. Platt,

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- J. P. Cunningham, B. M. Yu, K. V. Shenoy, and M. Sahani. Inferring neural firing rates from spike trains using Gaussian processes. In J. C. Platt, D. Koller, Y. Singer, and S. Roweis, eds., *Advances in Neural Information Processing Systems*, vol. 20, Red Hook, New York, 2008. Curran Associates, Inc.
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- J. Lücke and M. Sahani. Maximal causes for non-linear component extraction. *Journal of Machine Learning Research*, 9:1227–1267, 2008.
- G. Santhanam, B. M. Yu, V. Gilja, S. I. Ryu, A. Afshar, M. Sahani, and K. V. Shenoy. A factor-analysis decoder for high-performance neural prostheses. In *ICASSP’08: Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing, 2008*, pp. 5208–11, 2008.
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- L. Whiteley and M. Sahani. Implicit knowledge of visual uncertainty guides decisions with asymmetric outcomes. *Journal of Vision*, 8(3):2, 1–15, 2008.
- M. M. Churchland, B. M. Yu, M. Sahani, and K. V. Shenoy. Techniques for extracting single-trial activity patterns from large-scale neural recordings. *Current Opinion in Neurobiology*, 17(5):609–618, 2007.
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- R. E. Turner and M. Sahani. Probabilistic amplitude demodulation. In *Independent Component Analysis and Signal Separation*, Lecture Notes in Computer Science, pp. 544–551. Springer, 2007.
- R. E. Turner and M. Sahani. A maximum-likelihood interpretation for slow feature analysis. *Neural Computation*, 19(4):1022–1038, 2007.
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- B. M. Yu, C. Kemere, G. Santhanam, A. Afshar, S. I. Ryu, T. H. Meng, M. Sahani, and K. V. Shenoy. Mixture of trajectory models for neural decoding of goal-directed movements. *Journal of Neurophysiology*, 97(5):3763–3780, 2007.
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- G. Santhanam, M. Sahani, S. Ryu, and K. V. Shenoy. An extensible infrastructure for fully automated spike sorting during online experiments. In *Proceedings of the 26th Annual International Conference of the IEEE EMBS*, vol. 6, pp. 4380–4384, 2004.
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- M. Sahani and J. F. Linden. Evidence optimization techniques for estimating stimulus-response functions. In S. Becker, S. Thrun, and K. Obermayer, eds., *Advances in Neural Information Processing Systems*, vol. 15, pp. 301–308, Cambridge, Massachusetts, 2003. MIT Press.
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- C. Kemere, M. Sahani, and T. Meng. Robust neural decoding of reaching movements for prosthetic systems. In *Proceedings of the 25th Annual International Conference of the IEEE EMBS*, vol. 3, pp. 2079–2082, 2003.
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- M. Sahani. *Latent Variable Models for Neural Data Analysis*. PhD thesis, California Institute of Technology, Pasadena, California, 1999.
- M. Wehr, J. S. Pezaris, and M. Sahani. Simultaneous paired intracellular and tetrode recordings for evaluating the performance of spike sorting algorithms. *Neurocomputing*, 26–27:1061–1068, 1999.
- J. S. Pezaris, M. Sahani, and R. A. Andersen. Response correlations in parietal cortex. *Neurocomputing*, 26–27:471–476, 1999.
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J. S. Pezaris, M. Sahani, and R. A. Andersen. Tetrodes for monkeys. In J. M. Bower, ed., *Computational Neuroscience: Trends in Research, 1997*. Plenum, 1997.