

Curriculum Vitae
Jean-Marc FELLOUS
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Citizenship	French and U.S. Citizen.
Address	Neural Systems Memory and Aging University of Arizona 1501 N. Campbell Av. Life Sciences North, #384 Tucson, AZ 85724
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Laboratory Website.....	http://emotion.nsm.a.arizona.edu/lab.html

Chronology of Education

- 1988 **Engineer Diploma**, ESIM, Ecole Superieure d'Ingenieurs de Marseille, France (equivalent B.S.). Major fields: Electronics, Artificial Intelligence and Logic Programming.
- 1990 **D.E.A d'Intelligence Artificielle**, Paris VI University, France (M.S. in Artificial Intelligence) - with Honors. Advising Committee: Dr. J. Ferber, Dr. J. Pitrat.
Thesis: PACTOL: an adaptive and introspective actor formalism. Major field: Artificial Intelligence
- 1990 **Master's Degree** in Computer Science, University of Southern California, Los Angeles, CA.
- 1996 **Ph.D. Degree** in Computer Science, University of Southern California, Los Angeles, CA.
Advising Committee: Dr. M.A. Arbib (Chair), Dr. C. von der Malsburg and Dr. I. Biederman.
Thesis: A Neural Code for Face Representation: from V1 Receptive Fields to IT 'Face Cells'.
Major fields: Computer Science and Brain Theory

Chronology of Employment

Note: * indicates employment as graduate student

- *1990 - 1996 **Research assistant** (Dr. C. von der Malsburg, U.S.C.): Neural network self-organization applied to human face recognition.
- *1992 - 1995 **Teaching assistant** in the Biology Department at the University of Southern California for the undergraduate classes Bio-307 and Bio-306 (general human physiology), CSCI-301 (formal language theory), Bio-106 (introductory biology).
- 1999 - 2002 **Lecturer** in the Cognitive Science Department, University of California, San Diego. Teaching of 'Cognitive Neuroscience' (Cog.Sci. 17), lower-level undergraduate division.
- 1996 - 1997 **Sloan Postdoctoral Fellow** in Biology, Brandeis University, Boston, MA.
Dr. J. Lisman's laboratory (Neuroscience) and Dr. L. Zebrowitz's Laboratory (Psychology).
- 1997 - 2004 **Howard Hughes Medical Institute Research Associate (postdoctoral fellow)**, the Salk Institute, La Jolla, CA. Terrence J. Sejnowski laboratory (Neurobiology)
- 2004 - 2006 **Assistant Professor**. Joint appointment in the Departments of Biomedical Engineering and Center for Cognitive Neuroscience, Duke University, Durham, NC.
- 2006 – 2011 **Associate Professor** in the Department of Psychology and Applied Mathematics Graduate Interdisciplinary Program. University of Arizona, Tucson, AZ.
- 2011 – Present **Associate Professor with Tenure** in the Department of Psychology and Applied Mathematics Graduate Interdisciplinary Program. University of Arizona, Tucson, AZ.
- 2010 – Present **Consultant**. Hughes Research Laboratories, Malibu, CA

Service/Outreach

Local/state:

2007	Acting Director: Neural System Memory and Aging. Arizona Research Laboratory
9/2007 - 5/2008	Interim organizer of the Neuroscience Datablitz meeting
10/2007 - present	President of the Society for Neuroscience local chapter
2007 - present	Member of the Applied Mathematics, Neuroscience and Cognitive Science GIDPs
2008	Organizer: Brain awareness week
2008	Organizer: Halloween event (Spooky brains, Flandrau Center)
2008 - present	Affiliate member of the Biomedical Engineering GIDP
2009	Organizer: Brain awareness week
2009 - present	Organizer and Director: Senior Neuroscience Research Fellowship program (involving elders 55 and older in neuroscience research).
2010	Organizer: Brain awareness week
5/2010	Organizer of the symposium 'Multidisciplinary approaches to understanding the Mind and Brain', University of Arizona, May 9-11, 2010.
2010	Review committee of small grant proposals. Center for Insect Science.
2011	Organizer: Brain awareness week

National/International:

2006 - present	Member Elect of the Board of Directors of the Computational Neuroscience Organization
2006	Panelist for the National Defense Science and Engineering Graduate Fellowship
2007 - present	Panelist for the National Science Foundation Graduate Fellowship program
2007 - 2010	Panelist for the National Defense Science and Engineering Graduate Fellowship
2007	Organizer: Student poster awards chair at the Computational Neuroscience meeting
2008	Organizer: Student poster awards chair at the Computational Neuroscience meeting
2008 - present	Panelist for the NSF Collaborative Research in Computational Neuroscience program
2009 - present	Associate editor for IEEE Transactions on Affective Computing
2009	Organizer: Student poster awards chair at the Computational Neuroscience meeting

Ad hoc Reviewer for the following journals:

Nature, Science, the Journal of Neuroscience, the Journal of Physiology, Neuroscience, Psychological Reviews, Cerebral Cortex, Hippocampus, IEEE Spectrum, Vision Research, IEEE Transactions in Pattern Analysis and Machine Intelligence, IEEE Transactions on Evolutionary Computation, Network: computation in neural systems, Neural Computation, the Journal of Computational Neuroscience, Neurocomputing, Cognitive Neurodynamics, Learning and Memory, the Canadian Journal of Experimental Psychology, the Journal of Neurophysiology, Journal of Applied Physiology.

Reviewer for the following funding agencies:

National Science Foundation, US Department of Defense, US-Israel Binational Science Foundation (Israel), Agence Nationale de la Recherche (France), Neurological Foundation of New Zealand (New Zealand), Nederlandse organisatie voor wetenschappelijk onderzoek (Dutch organization for scientific research). Ad hoc reviewer for various internal UA grants.

Departmental committees:

2008	School of Neuroscience reorganization committee
2009 - present	Curriculum committee of the Department of Neuroscience
2009 - 2011	Executive committee of the graduate interdisciplinary program in Neuroscience
2009 - 2010	Applied Mathematics self-study Academic Program Review committee
2009	Psychology faculty recruiting committee
2009	Undergraduate in Biology Research Program admission committee
2010	Admission committee of the graduate interdisciplinary program in Neuroscience
2010 - present	Undergraduate Curriculum committee (Department of Psychology)
2010 - present	APR collaboration and outreach committees (Department of Psychology)
2010 - present	Undergraduate studies committee (Department of Neuroscience)
2011	Admission committee of the graduate interdisciplinary program in Neuroscience

College committee: none

University Committee: none

Other Committees: none

Publications/Creative Activity

Note: * indicates work performed as a graduate student, + indicates work performed at Duke University

Scholarly Books and Book Chapters

Books

1. **Fellous JM and Arbib MAA** (Editors). Who needs emotions? The brain meets the Robot. Oxford University Press, 2005.

Book chapters

- *1. **LeDoux JE and Fellous JM**. Emotion and Computational Neuroscience. In: *The Handbook of Brain Theory and Neural Networks*, edited by Arbib MA: M.I.T. Press, p. p356-359, 1995. Review.
2. **Fellous JM, Johnston T, Segal M and Lisman JE**. Carbachol-Induced rhythms in the hippocampal slice: Slow (.5-2Hz), Theta (4-10Hz) and Gamma (80-100Hz) Oscillations. In: *Computational Neuroscience: Trends in Research*, edited by Bower JM. New York: Plenum, p. 367-372, 1998. Original Research.
3. **Fellous JM, Armony J and LeDoux JE**. Emotion and Computational Neuroscience. In: *The Handbook of Brain Theory and Neural Networks*, second edition, edited by Arbib MA: M.I.T. Press, p398-401, 2003. Review.
4. **Fellous JM and Suri R**. The Roles of Dopamine. In: *The Handbook of Brain Theory and Neural Networks*, second edition, edited by Arbib MA: M.I.T. Press, p361-365, 2003. Review.
5. **Fellous JM and LeDoux JE**. Towards basic principles for emotional processing: What the fearful brain tells the robot. In *Who Needs Emotions? The brain meets the Robot*. Fellous JM and Arbib MAA (Editors), Oxford University Press, p79-115, 2005. Review.
6. **Gunay C, Smolinski TG, Lytton WW, Morse TM, Gleeson P, Crook S, Steuber V, Silver A, Voicu H, Andrews P, Bokil H, Maniar H, Loader C, Mehta S, Kleinfeld D, Thomson D, Mitra PP, Aaron G, Fellous JM**. A method for discovering spatio-temporal spike patterns in multi-unit recordings. In computational Intelligence in Electrophysiology: Trends and Open Problems. In: Smolinski TG, Milanova MG, Hassanien A-E (eds), *Applications of Computational Intelligence in Biology: Current Trends and Open Problems*, Chapter XIV, Springer, p325-359, 2008. Original Research.
7. **Navratilova, Z. and Fellous JM**. A Biophysical Model of Cortical Up and Down States: Excitatory and Inhibitory Balance and H-Current. *Lecture Notes in Computer Science*, Springer, p61-66, 2008. Original Research.
8. **Fellous JM, Sejnowski TJ, Navratilova Z**. Intrinsic and Network Contributions to Reverberatory activity: Reactive Clamp and Modeling Studies. In *The Dynamic-clamp: from principles to applications*. Destexhe A. and Bal T (eds), Springer, p237-260, 2009. Original Research.
9. **Fellous JM**. Emotion: Computational Modeling. In *the Encyclopedia of Neuroscience*. L.R. Squire (ed.) Oxford Academic Press, Vol 3, p909-913, 2009. Review.
10. **Fellous JM and Johnson D**. Senior editors. Proceedings of the Computational Neuroscience Meeting, CNS*2010. Special issue of *BioMed Central Neuroscience 11:Suppl-1*, in press 2010 – Open Access publisher (<http://www.biomedcentral.com/bmcneurosci/>)

Peer reviewed journals articles

- *1. **Wiskott L, Fellous JM, Kruger N and von der Malsburg C**. Face Recognition by Elastic Bunch Graph Matching. *IEEE spectrum* 19: 775-779, 1997.
- *2. **Fellous JM**. Gender discrimination and prediction on the basis of facial metric information. *Vision Research* 37: 1961-1973, 1997.
3. **Lisman JE, Fellous JM and Wang X-J**. A role for NMDA-receptor channels in working memory. *Nature Neuroscience* 1: 273-275, 1998.
4. **Fellous JM and Linster C**. Computational models of neuromodulation. *Neural computation* 10: 771-805, 1998.
5. **Fellous JM**. The neuromodulatory basis of emotion. *The Neuroscientist* 5: 283-294, 1999.

6. **Fellous JM and Sejnowski TJ.** Cholinergic induction of oscillations in the hippocampal slice in the slow (0.5-2 Hz), theta (5-12 Hz), and gamma (35-70 Hz) bands. *Hippocampus* 10: 187-197, 2000.
7. **Houweling AR, Modi RH, Ganter P, Fellous JM and Sejnowski TJ.** Models of frequency preferences of cortical pyramidal cells and interneurons. *Neurocomputing*, Vol 38-40, pp 231-238, 2001.
8. **Scheler G and Fellous JM.** Dopamine modulation of prefrontal delay activity- Reverberatory activity and sharpness of tuning curves. *Neurocomputing*, 38-40: 1549-1556, 2001.
9. **Tiesinga PHE, Fellous JM, Jose JV and Sejnowski TJ.** Optimal information transfer in synchronized neocortical neurons. *Neurocomputing*, 38-40: 397-402, 2001.
10. **Tiesinga PHE, Fellous JM, Jose JV and Sejnowski TJ.** Computational model of carbachol-induced delta, theta and gamma oscillations in the hippocampus. *Hippocampus* 11: 251-274, 2001.
11. **Fellous JM, Houweling AR, Modi RH, Rao RPN, Tiesinga PHE and Sejnowski TJ.** Frequency dependence of spike timing reliability in cortical pyramidal cells and interneurons. *J Neurophysiology* 85:1782-1787, 2001.
12. **Blanchard C, Blanchard R, Fellous JM, Guimaraes FS, Irwin W, LeDoux JE, McGaugh JL, Rosen, JB, Schenberg LC, Volchan E and Da Cunha C.** The brain decade in debate: III. Neurobiology of emotion. *Brazillian journal of medical and biological research*, 34:283-293, 2001.
13. **Destexhe A, Rudolph M, Fellous JM and Sejnowski TJ.** Fluctuating synaptic conductances recreate in-vivo-like activity in neocortical neurons. *Neuroscience*, 107(1):13-24, 2001.
14. **Tiesinga PHE, Fellous JM, Jose JV and Sejnowski TJ.** Information transfer in entrained cortical neurons. *Network: Computation in Neural System*, 13:41-61, 2002.
15. **Tiesinga PHE, Fellous JM and Sejnowski TJ.** Attractor reliability reveals deterministic structure in neuronal spike trains, *Neural Computation*, 14:1629-1650, 2002.
16. **Tiesinga PHE, Fellous JM, Sejnowski TJ.** Spike-time reliability of periodically driven integrate and fire neurons. *Neurocomputing*, 44-46: 195-200, 2002.
17. **Schreiber S, Whitmer D, Fellous JM, Tiesinga PHE, Sejnowski TJ.** A new correlation-based measure of spike timing reliability. *Neurocomputing*, 52-54: 925- 931, 2003.
18. **Thomas PJ, Tiesinga PHE, Fellous JM, Sejnowski TJ.** Reliability and Bifurcation in Neurons Driven by Multiple Sinusoids. *Neurocomputing*, 52-54: 955- 961, 2003.
19. **Zebrowitz LA, Fellous JM, Mignault A and Andreoletti C.** Trait Impressions as Overgeneralized Responses to Adaptively Significant Facial Qualities: Evidence from Connectionist Modeling. *Journal of Personality and Social Psychology*, 7(3):194-215, 2003.
20. **Fellous JM and Sejnowski TJ.** Regulation of persistent activity by background inhibition in an *in vitro* model of a cortical microcircuit. *Cerebral Cortex*, 13:1232-1241, 2003.
21. **Fellous JM, Rudolph M, Destexhe A and Sejnowski TJ.** Synaptic background noise controls the input/output characteristics of single cells in an in vitro model of in vivo activity. *Neuroscience*, 122:811-829, 2003.
22. **Schreiber S, Fellous JM, Tiesinga PHE and Sejnowski TJ.** Influence of ionic conductances on spike timing reliability of cortical neurons for suprathreshold rhythmic inputs. *J Neurophysiology*, 91:194-205, 2004.
23. **Tiesinga PHE, Fellous JM, Salinas E, Jose JV, Sejnowski TJ.** Synchronization as a mechanism for attentional gain modulation. *Neurocomputing*, 58-60: 641-646, 2004.
24. **Fellous JM, Tiesinga PHE, Thomas PJ and Sejnowski TJ.** Discovering spike time patterns in neural responses. *Journal of Neuroscience*, 24(12):2989-3001 2004.
25. **Arbib MA and Fellous JM.** Emotions: From Brain to Robot. *Trends in Cognitive Science*, 8(12):554-561, 2004.
26. **Tiesinga PHE, Fellous JM, Salinas E, Jose JV and Sejnowski TJ.** Inhibitory Synchrony as a mechanism for attentional gain modulation, *The Journal of Physiology (Paris)*, 98:296-314, 2004.
27. **Bazhenov M, Rulkov NF, Fellous JM, Timofeev I.** Role of network dynamics in shaping timing reliability. *Physical Review E*. 72,041903, 2005.
- +28. **Fellous JM.** A Mechanistic View of the Expression and Experience of Emotion in the Arts. *American Journal of Psychology*. 119(4): 668-674, 2006.
- +29. **Mishra J, Fellous JM, Sejnowski TJ.** Selective Attention through Phase Relationship of Excitatory and Inhibitory Input Synchrony in a Model Cortical Neuron. *Neural Network*. 19:1329-1346, 2006.

- +30. **Polikov VS, Block ML, Fellous JM, Hong JS and Reichert WM.** In vitro model of glial scarring around neuroelectrodes chronically implanted in the CNS. *Biomaterials*, 27:5368–5376, 2006.
- 31. **Zebrowitz LA, Kikuchi M and Fellous JM.** Are effects of emotion expression on trait impression mediated by babyfacedness? Evidence from connectionist modeling. *Personality and Social Psychology Bulletin*. 33:648-662, 2007.
- 32. **Tiesinga PHE, Fellous JM, Sejnowski TJ.** Regulation of spike timing in visual cortical circuits. *Nature Reviews Neuroscience*, 9:97-109, 2008.
- 33. **Paulk AC, Phillips-Portillo J, Dacks AM, Fellous JM and Gronenberg W.** The processing of color, motion, and stimulus timing are anatomically segregated in the bumblebee brain. *The Journal of Neuroscience*, 28(25):6319-32, 2008.
- 34. **Tatsuno M, Fellous JM and Amari S.** Information geometric measures as robust estimators of connection strengths and external inputs, *Neural Computation*, 21(8):2309-2335, 2009.
- 35. **Paulk AC, Dacks AM, Phillips-Portillo J, Fellous JM and Gronenberg W.** Visual processing in the central bee brain, *The journal of Neuroscience*, 29(32):9987-9, 2009.
- 36. **Zebrowitz LA, Kikuchi M and Fellous JM.** Facial Resemblance to Emotions: Group Differences, Impression Effects, and Race Stereotypes. *Journal of Personality and Social Psychology*, 98(2):175-89, 2010.
- 37. **Stiefel K, Thomas PJ, Fellous JM and Sejnowski TJ.** Intrinsic Sub-threshold Oscillations Extend the Influence of Inhibitory Synaptic Inputs on Cortical Pyramidal Neurons, *The European journal of Neuroscience*, 31:1019-1026, 2010.
- 38. **Samson RD, Frank MJ, Fellous JM.** Computational models of reinforcement learning: the role of dopamine as a reward signal. *Cognitive Neurodynamics*, 4:91-10, 2010.
- 39. **Wang H-P, Spencer D, Fellous JM, Sejnowski TJ.** Synchrony of thalamocortical inputs maximizes cortical reliability. *Science*, 328:106-109, 2010.
- 40. **Navratilova Z, Giacomo LM, Fellous JM, Hasselmo ME, and McNaughton BL.** Phase Precession and Variable Spatial Scaling in a Periodic Attractor Map Model of Medial Entorhinal Grid Cells with Realistic After-Spike Dynamics. *Hippocampus*. In Press 2011.
- 41. **Toups JV, Fellous JM, Thomas PJ, Sejnowski TJ, Tiesinga PH.** Finding the event structure of neuronal spike trains. *Neural Computation*. In Press 2011.
- 42. **David Lyttle and Jean-Marc Fellous.** A new similarity measure for spike trains: Sensitivity to bursts and periods of inhibition. *J Neuroscience Methods*, In press, 2011.

Electronic publications

- 1. **Fellous JM.** Models of emotion. *Scholarpedia*, 2(11):1453, 2007.
http://www.scholarpedia.org/article/Models_of_emotion

Work in Progress

Submitted

- 1. **Fellous JM, Corral-Frias N.** Reliability and precision are optimal for non-uniform distributions of presynaptic release probability. In re-submission (Proceedings of the National Academy of Sciences).
- 2. **Valdes JV, McNaughton BL, Fellous JM.** Reactivation of populations of ventral tegmental area neurons in the rat.
- 3. **Watkins L., Gereke B. G. M. Martin, JM Fellous** The Traveling Salesrat: Insights into optimal spatial navigation and the role of the dopaminergic system.

In preparation (likely submission in 2011)

1. **Tatsuno M., Lipa P, McNaughton BL, Fellous JM.** Long term reactivation dynamics of multiple assemblies in hippocampus and prefrontal cortex.
3. **Corral-Frias NS, Valdes JM, French ED, Fellous JM.** The role of the ventral tegmental area in posttraumatic stress disorder.
4. **Bethany Jones, Lynn Nadel and Jean-Marc Fellous.** Re-making memories: A novel paradigm to study memory reconsolidation in rat.
5. **Song, M and Fellous JM.** The role of the ventral tegmental area in memory extinction.
6. **Jean-Marc Fellous.** Computational models of neuromodulation. Invited book chapter in 'From Neuron to Cognition via Computational Neuroscience' (M.A. Arbib, editor). Target publication Fall 2011.

Media

5. **UA now:** Interview (5/2010, with Tony Lewis). 'Robots: One Day They'll Walk Your Dog, Do Your Dishes and Tutor Your Kids'. <http://uanews.org/node/31856>
4. **UA now:** Interview (5/2010): UA Researchers and Students to Educate the Public on Healthy Brain Activities. <http://uanews.org/node/30583>
3. **SFN featured chapter website** (5/2010): Written piece. 'Chapter Showcase'. http://www.sfn.org/index.aspx?pagename=Chapters_Showcase
2. **UA now:** Interview (7/2009). 'Neuroscience Researchers Seek Interns ages 55 and Up' <http://uanews.org/node/26502>
1. **National Public Radio** interview (10/2008): All things considered, 'New program maps virtual rat brain in 3D'. <http://www.npr.org/templates/story/story.php?storyId=97274006>

Scholarly Presentations

Conferences

Note: + indicates peer-reviewed abstracts, * indicates work as a graduate student.

- *1. **Shams L, Fellous JM and von der Malsburg C.** A Comparative Study of Gabor and Pixel Representations in Original and PC Spaces. *World Congress on Neural Networks*, Washington DC, 1995.
- *2. **Fellous JM.** A M.I.M.D. Implementation for Multi-Level Neural Modeling. *World Congress in Neural Networks*, Washington, D.C., 1995.
- *3. **Fellous JM and Hudlicka E.** Using the World-Wide-Web as a tool for an interdisciplinary approach to the scientific study of emotion. *Society for Neuroscience*, Washington D.C., 1996, p. 246.
4. **Fellous JM and Lisman JE.** Working memory mediated by NMDA channels: Implications for Schizophrenia. *Society for Neuroscience*, New Orleans, 1997, p. 776.
5. **Fellous JM and Sejnowski TJ.** The involvement of CA1 and CA3 in Carbachol-induced oscillations in the hippocampal slice. *Society for Neuroscience*, Los Angeles, CA, 1998.
6. **Fellous JM, Houweling AR, Modi RH, Rao RPN and Sejnowski TJ.** Spike timing reliability in the prefrontal cortex depends on the frequency content of its synaptic inputs. *Society for Neuroscience*, Miami, 1999, p. 885.
7. **Fellous JM, Destexhe A and Sejnowski TJ.** Dynamic clamp of cortical neurons in vitro simulates in vivo activity patterns. *Society for Neuroscience*, New Orleans, 2000, p. 1623.
8. **Tiesinga PHE, Fellous JM, Jose JV and Sejnowski TJ.** Computational model of carbachol-induced delta, theta and gamma oscillations in the hippocampus. *Society for Neuroscience*, New Orleans, 2000.
9. **Jose JV, Tiesinga PHE, Fellous JM and Sejnowski TJ.** Entrainment by synchronized inhibition boosts information transfer in neocortical neurons. *Society for Neuroscience*, New Orleans, 2000.
- + 10. **Scheler, G and Fellous, JM.** Impairment of decision-making in prefrontal cortex by a low dopaminergic tone: A computational model. *Journal of Cognitive Neuroscience*. P30E, 2000.

11. **Zebrowitz LA and Fellous, JM.** Trait Impressions of Neutral Expression Faces Predicted from Connectionist Modeling of Facial Metric Information from Angry and Happy Faces. *Feelings and Emotions: The Amsterdam Symposium*, the Netherlands June 13-16, 2001.
12. **Fellous JM and Sejnowski TJ.** Dopamine facilitates the sustained firing of rat layer V prefrontal pyramidal cells in vitro. *Society for Neuroscience*, San Diego, 2001.
13. **Tiesinga PHE, Thomas P, Fellous JM, Sejnowski TJ.** Reliability, precision and the neuronal code. *Society for Neuroscience*, San Diego, 2001.
14. **Jose JV, Tiesinga PHE, Fellous JM, Salinas E, Sejnowski TJ.** Synchronization as a mechanism for attentional modulation. *Society for Neuroscience*, San Diego, 2001.
15. **Jose JV, Tiesinga PHE, Fellous JM, Salinas E, Sejnowski TJ.** Is attentional gain modulation optimal at gamma frequencies? *Society for Neuroscience* 55.6, Orlando, FL, 2002.
16. **Fellous JM, Schreiber S, Tiesinga PHE, Sejnowski TJ.** Modulation of the Frequency Preference and Attractor Structure of Prefrontal Cortical Neurons. *Society for Neuroscience* 445.19, Orlando, FL, 2002.
17. **Fellous JM, Spencer D, Wang HP, Junek S, Eagleman DM, Sejnowski TJ.** Firing reliably with unreliable synapses. *Society for Neuroscience*, New Orleans, 2003.
18. **Stiefel KM, Fellous JM, Sejnowski TJ.** Interaction of sub-threshold Oscillations with Synaptic Inputs in the Cortex. *Society for Neuroscience*, New Orleans, 2003.
19. **Thomas PJ, Fellous JM, Tiesinga PHE, Sejnowski TJ.** Experimental characterization of single neuron spike-time patterns. *Society for Neuroscience*, New Orleans, 2003.
20. **Mishra J, Fellous JM, Sejnowski TJ.** A Biophysical Neuronal Model Exploring Attention Mechanisms in Visual Cortex. *Society for Neuroscience*, San Diego, 2004.
21. **Toups JV, Fellous JM and Tiesinga PH.** Statistical validation of spike patterns revealed by fuzzy clustering algorithms. *Society for Neuroscience*, San Diego, 2004.
22. **Wang HP, Fellous JM, Spencer DJ, and Sejnowski TJ.** Reliability of V1 Cell Responses to Thalamic Natural Stimulus Inputs. *Society for Neuroscience*, Washington DC, 2005.
23. **Buntaine A, Hoang V, Bhanpuri N and Fellous JM.** Stochastic synaptic transmission in Hippocampus and Cortex. *Society for Neuroscience*, Atlanta, 2006.
24. **Lipa P, Tatsuno M, Amari S, McNaughton BL and Fellous JM.** A Novel Analysis Framework for Characterizing Ensemble Spike Patterns Using Spike Train Clustering and Information Geometry. *Society for Neuroscience*, Atlanta, 2006.
25. **Toups JV, Fellous JM, Thomas PJ, Tiesinga PHE and Sejnowski TJ.** Stability of in vitro spike patterns under variation of stimulus amplitude. *Society for Neuroscience*, Atlanta, 2006.
- +26. **Buntaine A, Corral-Frias N and Fellous JM.** Emergence of reliable spike patterns in models of CA1 cells contacted by unreliable synapses. *Computational Neuroscience*, Toronto, CA, 2007, and *BMC Neuroscience* 2007, 8(Suppl 2):P71.
27. **Tatsuno M; Lipa P; McNaughton BL; Fellous JM.** Dynamics of Neural Assemblies Involved in Memory-Trace Replay. *Society for Neuroscience*, San Diego, 2007.
28. **Navratilova Z and JM Fellous JM.** A Biophysical Model of Cortical Up and Down States: Roles of Excitatory and Inhibitory Balance and H Current. *Society for Neuroscience*, San Diego, 2007.
29. **Jones B, McClung A, Hupbach A, Hardt O, Gomez R, Nadel L, Fellous JM.** Dynamics of sequence learning in rats: The influence of reminders and training by blocks. *Society for Neuroscience*, San Diego, 2007.
- +30. **N. Corral-Frias, A. Buntaine and JM Fellous.** ¿Teléfono descompuesto en el cerebro?: Patrones precisos de actividad neural en CA1 a partir de sinapsis no confiables. Modelando una explicación. XV Congreso Mexicano de Psicología, Hermosillo, MX, 2007. **Winner of the best poster of the meeting.**
31. **H.P. Wang, D J. Spencer, JM Fellous and T.J. Sejnowski.** Synchronous Thalamic Inputs Drive Cortical Neurons Reliably with Balanced Excitatory and Inhibitory Inputs. *Society for Neuroscience*, San Diego, 2007.
- +32. **Navratilova Z, Fellous JM, McNaughton BL.** Intrinsic current generated, omnidirectional phase precession and grid field scaling in toroidal attractor model of medial entorhinal path integration. *Computational Neuroscience*, Portland OR, 2008.
33. **Hoang LT, Fellous JM, Barnes CA.** Expression of the immediate-early gene Arc in rat ventral tegmental neurons during aging. *Society for Neuroscience*, Washington DC, 2008.

34. **Valdes JL, McNaughton BL and Fellous JM.** Reactivation of populations of ventral tegmental area neurons in the rat. *Society for Neuroscience*, Washington DC, 2008.
35. **Corral-Frias NS, Valdes JL, Fellous JM, French ED.** Latent effects of inescapable footshock on Ventral Tegmental Area dopamine cell excitability. *Society for Neuroscience*, Washington DC, 2008.
36. **Zimmerman P, Alves C, Fellous JM, Gibboni R, Laine C, Mosher C, Wood K, Gothard K.** Visual exploration of conspecifics faces during sex discrimination. *Society for Neuroscience*, Washington DC, 2008. Withdrawn.
37. **Navratilova Z, Fellous JM, McNaughton BL.** Intrinsic current based phase precession in a toroidal attractor model of path integration in medial entorhinal cortex (MEC) grid cells: effects of speed input and intrinsic current time constants. *Society for Neuroscience*, Washington DC, 2008.
38. **McNaughton BL, Hoang LT, Valdes JL, Maurer AP, Burke SN, Fellous JM.** Distinct characteristics of CA1 place cells correlated with medial or lateral entorhinal cortex layer III input. *Society for Neuroscience*, Washington DC, 2008.
39. **Toups JV, Fellous JM, Sejnowski TJ and Tiesinga PH.** Heuristics for revealing the event structure of neuronal spike trains. *Society for Neuroscience*, Washington DC, 2008.
40. **Corral-Frias NS, Valdes JL, French ED, Fellous JM.** Efectos latentes del estrés en ratas: Influencia en la excitabilidad de células dopaminérgicas del área tegmental ventral. *XVI Congreso Mexicano de Psicología* Monterrey, Nuevo León, México, 10/2008.
41. **Sarah J. Cook, Nadia Corral-Frias, Julia Cremer, Jose L. Valdes, Jean-Marc Fellous.** Learning to give up! The contribution of the rodent dopaminergic system to extinction. *Society for Neuroscience*, Chicago IL, 2009.
42. **Gregory L. Powell, Jason Q. Pilarski, Ralph F. Fregosi, Jean-Marc Fellous.** Development of a network model to predict alterations in PreBötzing Complex neurons caused by prenatal nicotine exposure. *Society for Neuroscience*, Chicago IL, 2009.
43. **Corral-Frias NS, Cremer JK, Valdes JM, French ED, Fellous JM.** Role of the ventral tegmental area in anxiety disorders: electrophysiological and reversible inactivation studies in a rodent model of posttraumatic stress disorder. *Society for Neuroscience*, Chicago IL, 2009.
44. **Jones B, Nadel L and Fellous JM.** Re-making memories: A novel paradigm to study memory reconsolidation in rats. *Society for Neuroscience*, Chicago IL, 2009.
45. **H.P. Wang , D.J. Spencer, J.M. Fellous, T.J. Sejnowski.** Reliable Transmission of Visual Inputs into Cortex Depends on Thalamic Synchrony. *Society for Neuroscience*, Chicago IL, 2009.
46. **L. Watkins, G. M. Martin, JM Fellous** The Traveling Salesrat: Insights into optimal spatial navigation and the role of the dopaminergic system. *Society for Neuroscience*, Chicago IL, 2009.
- +47. **P.J. Thomas, J. V. Toups, JM Fellous, T J. Sejnowski and P Tiesinga.** Multiple spike time patterns occur at bifurcation points of membrane potential dynamics. *Computational and Systems Neuroscience*, Salt Lake city, Utah, 2010.
48. **M. Song, S.J. Cook, N. Corral-Frias and JM Fellous.** The role of the ventral tegmental area in the extinction of probabilistic events. *Society for Neuroscience*, San-Diego, CA, 2010.
49. **D. Lyttle, JM Fellous.** Analyzing spike train similarity measures: the effects of bursts and silence. *Society for Neuroscience*, San-Diego, CA, 2010.
50. **NS Corral-Frias, SW Brookshire, K. Edelman-Vogelsang, JL Valdes, ED French and JM Fellous.** Behavioral and electrophysiological studies of the Ventral Tegmental Area after trauma. *Society for Neuroscience*, San-Diego, CA, 2010.
51. **B. Jones, E. Bukoski, L. Nadel, JM Fellous.** The effects of aging on spatial memory reconsolidation in rats. *Society for Neuroscience*, San-Diego, CA, 2010.
52. **L. Watkins de Jong, B. Gereke, NS Corral-Frias, K. Scott, G. Martin, JM Fellous.** The role of the dopaminergic system in optimal spatial navigation. *Society for Neuroscience*, San-Diego, CA, 2010.
53. **JL. Valdés , B. McNaughton, JM Fellous.** Experience-dependent Reactivations of Ventral Tegmental Area Neurons in the Rat. *Computational Neuroscience Meeting CNS*2011*, Stockholm Sweden, 2011.
54. **P. Tiesinga, JM Fellous, TJ Sejnowski, V Toups, P Thomas.** Finding the event structure of neuronal spike trains. *Computational Neuroscience Meeting CNS*2011*, Stockholm Sweden, 2011.
55. **ME Waterkotte, M Song, JM Fellous.** The effect of caffeine on the extinction of probabilistic rewards. *Society for Neuroscience*, Washington DC, 2011.

56. **D.A. Stidd, J.P. Langevin, JM Fellous.** Effect of intraperitoneal paroxetine in a rat model of posttraumatic stress disorder. *Society for Neuroscience*, Washington DC, 2011.
57. **K. Edelman-Vogelsang, R. LaHood, NS Corral-Frias, ED French, JM Fellous.** Sex Differences in a Rat Model of PTSD. *Society for Neuroscience*, Washington DC, 2011.
58. **NS Corral-Frias, WJ Jacobs, L. Nadel, JM Fellous.** Reward as a resilience factor: Responses to Psychosocial Stress. *Society for Neuroscience*, Washington DC, 2011.
59. **B. Gereke, RJ Compton, JM Fellous.** Sex Differences in Rodent Optimal Spatial Navigation: Influences of Estrous Cycle and Object Cues in the Traveling Salesperson Problem. *Society for Neuroscience*, Washington DC, 2011.
60. **MD Howard, R Bhattacharyya, RC. O'Reilly, G. Ascoli and JM Fellous.** Adaptive Recall in Hippocampus. *Biologically Inspired Cognitive Architectures*. Arlington VA, 2011.

Talks past 5 years (invited)

12. Lecture. Undergraduate in Biology Ethics Retreat. University of Arizona, May 2011. *The use of animals in research.*
11. Colloquium. University of California, Riverside, May 2011. *The role of the ventral tegmental area in learning and memory.*
10. Distinguished Lecturer Colloquium. University of South Florida, March 2011. *Neural Computations: From face perception to optimal spatial navigation.*
9. Colloquium. Department of Psychology, University of Arizona, Sept 2010. *The role of the rodent dopaminergic system of the Ventral Tegmental Area in learning and memory.*
8. Colloquium. Hughes Research Laboratories, Malibu, CA, August 2010. *Can rat solve the traveling salesperson problem?*
7. Symposium on Multidisciplinary approaches to understanding the mind and brain (Fellous, Lewis Organizers). May 9-12, 2010. *Can rats solve the traveling salesperson problem?*
6. Cognitive Neuroscience Society meeting, Montreal, CA, 2010. Symposium on brain oscillations, dynamic synchrony and cognition (M.X. Cohen organizer). *Keep it in mind: Reactivation in the Ventral Tegmental Area of the Rodent.*
5. University of Queensland, Australia. Thinking System Group, January 14, 2010. *Can rat solve the traveling salesperson problem?*
4. University of Queensland, Australia. Queensland Brain Institute. January 13, 2010. Colloquium. *Evidence for the Involvement of the Dopaminergic System in Posttraumatic Stress Disorder.*
3. University of Queensland, Australia. January 4-12, 2010. 'Summer of Spikes' meeting (J Wiles, A. Paulk organizers). 3 public lectures:
 - *Basic issues in neural data analyses: Finding patterns.*
 - *Neuromodulatory power same neurons, different computations.*
 - *It's time for spikes! Spike timing and spike patterns.*
2. University of Arizona. Neurology Grand Rounds. *Evidence for the involvement of the dopaminergic system in post traumatic stress disorder.* Dec 2009.
1. Arizona State University, Tempe, AZ. Colloquium. *Is it time for spikes?* April 2008.

Other talks (last 4 years):

Spring 2010:

Workshop on Neural simulation (University of Arizona, T Carnavale, M Hines organizers): *Computational neuromatrimony. Dealing with failures to communicate.*

Spring 2009:

Dept of Psychology Recruitment weekend: *Is it worth remembering? Reactivation of the ventral tegmental area*
 Applied Mathematics Recruitment weekend: *Can rats solve the traveling salesperson problem?*

Fall 2007:

Neuroscience GIDP retreat: *Like it or Not! Neurophysiology of the Ventral Tegmental Area*
 Applied Mathematics, Quantitative Biology Colloquium: *Reliability and Precision of Spike timing*

Spring 2007:

Applied Mathematics Workshop: *Introduction to Neural Modeling.*
 Applied Mathematics Workshop: *Neural computations.*
 Recruitment weekend, Neuroscience GIDP: *The computational and experimental Laboratory*
 Recruitment weekend, UBRP program: *The computational and experimental Laboratory*
 Seminar Neural System Memory and Aging: *Reliable Spiking with Unreliable Synapses*
 Cognitive Science Colloquium: *Spikes...! It's about time!*
 Neuroscience DataBlitz: *Mona Lisa's smile: The Da Vinci code broken by a neural network*

Other talks (invited, 6 years and more)

11. University of Hawaii, Manoa. *Discovering spike patterns*, August 2005.
10. Stanford University, March 2004. Keynote speaker. American Association for Artificial Intelligence, Spring Symposium on architectures for modeling emotion: cross-disciplinary foundations. *From Human Emotions to Robot Emotions.*
9. University of California, Irvine, Dec 2003. *Spike patterns: One step beyond spike rates and spike timing.*
8. Duke University, September 2003. Center for Cognitive Neuroscience. *Spikes: It's (also) about time!*
7. Rutgers University, Newark, NJ. March 2003. *Regulation of persistent activity in an in vitro model of a prefrontal cortical microcircuit: Synergistic roles of dopamine modulation and inhibition.*
6. Duke University, February 2003. Biomedical Engineering Department. *Spikes: Get real! Understanding neural processing in vivo using computational and in vitro preparations.*
5. University of California, Riverside, October 2002. Department of Biomedical Sciences. *Make them talk!: The mysteries of synaptic transmission.*
4. University of Utah, Salt Lake City, UT, July 2002. Pain Management Department. Pain and Negative Emotion: Towards an Interdisciplinary Synthesis (official Satellite Meeting for the 10th International Association for the Study of Pain (IASP) World Congress on Pain). *The neural bases of emotion.*
3. University of Texas, Houston, TX, May 2002. Department of Neurobiology and Anatomy. *Gain and signal-to-noise modulation.*
2. University of Louisville, KY, March 2002. Psychology Department. *Neural computing with noise.*
1. University of Texas, Southwestern Medical Center, Dallas, TX, January 2002. Psychiatry Department. *Computational roles of noise and neuromodulation.*

List of collaborators on grants and publications (past 5 years)

Note: graduate students and postdoctoral fellows are not listed.

Aaron G, Amari S, Arbib MA, Andrews P, Barnes C, Bazhenoz M, Bokil H, Crook S, Fasel I, Frank MJ, Fregosi R, French E, Hardt O, Johnson D, Gleeson P, Gomez R, Gothard K, Gronenberg W, Gunay C, Jacobs J, Kleinfeld D, Langevin JP, Knierim J, LeDoux JE, Lewis T, Loader C, Lytton WW, Mehta S, Maniar H, G. Martin, McNaughton BL, Mitra PP, Morse TM, Nadel L, Reichert WM, Sejnowski TJ, Silver A, Smolinski TG, Stiefel K, Steuber V, Tatsuno M, Thomas PJ, Thomson D, Tiesinga PT, Timofeev I, Touretzky D, Valdes JL, Voicu H, Weitzenfeld A, Zebrowitz L.

Extent of teaching (chronological, past 5 years)

Semester	Course number	Title	Enrollment
Fall 2005	BME 265	Neural data analyses	14
Fall 2006	PSYC 302	Introduction to Biopsychology	126
Spring 2007	PSYC 4/596L	Introduction to neural data analyses	8
Fall 2007	PSYC 302	Introduction to Biopsychology	130
Fall 2007	PSYC 4/503c	Introduction to Computational Neuroscience	15
Fall 2008	PSYC 302	Introduction to Biopsychology	121
Fall 2008	PSYC 4/596L	Introduction to neural data analyses	6
Spring 2009	ECE 596c	Cognitive Robotics (10%)	11
Fall 2009	PSYC 302	Introduction to Biopsychology	136
Fall 2009	PSYC 506A	Computations in neural systems	17
Spring 2010	ECE 596c	Cognitive Robotics (10%)	10
Fall 2010	PSYC 302	Introduction to Biopsychology	123
Fall 2010	PSYC 4/503c	Introduction to Computational Neuroscience	12
Fall 2010	APPL 595B	Applied Mathematic Journal Club	10

Notes:

- BME 265 was upper division undergraduate and was taught at Duke University. It was the first version of PSYC 496L.
- ECE 596c: Cognitive Robotics is co-taught (A. Lewis, main instructor 80% and I. Fasel, 10%).
- co-organizing (with K. Lin): Theoretical Neuroscience Journal Club (Applied Mathematics, 3 times a year, 2007-present, self-organized, about 5-10 attendees/semester, see lab website for content). The class has been 'officialized' in Fall 2010 as APPL595B and is now offered for credit.
- Guest lectures in Psyc 506B (Spring 2007, Spring, 2008, Spring 2009. L. Nadel, Instructor), and Psyc 597G (Spring 2009, R. Bootzin, Instructor)

Individual Student Contact

Current advising:

- Main graduate advisor: 4
Nadia Corral-Frias (Neuroscience, PhD program, 2007-present), Bethany Jones (Neuroscience, PhD program, 2007- present), Minryung Song (Neuroscience, PhD program, 2009- present), David Lyttle (Applied Mathematics, PhD program, 2010- present)
- Main undergraduate advisor: 3
Megan WaterKotte (Honor thesis, Psychology), Ryan LaHood, Ryan Compton
- Independent studies: 5
Elizabeth Bukoski, Brian Gereke, Katherine Scott, Kim Vogelsang, Patrick Greene.
- Thesis committee member: 5
Beth Salvagio (Psychology, PhD), Shikhar Kumar (Psychology, PhD), Christopher Laine (Physiology, PhD), Ann Revill (Physiology, PhD), James Phillips-Portillo (Insect Science, PhD).

Past advising (5 years):

- Main postdoctoral advisor: 1
Jose Valdes (2006-2009, left the laboratory to take a faculty position at the University of Chile)
- Main graduate student advisor: 1
Wahab Hanif (Psychology, M.S., 2009)
- Main undergraduate advisor: 6
Sarah Cook (UBRP, 2008), Jessica Gifford (Honors thesis, 2007-2008), Chu Qin (BRAVO program, summer 2008), Lilian Patron (preceptor Psyc 302, Fall 2008), Elizabeth Bukoski (preceptor Psyc 302, Fall 2009),

Jennifer Vega (preceptor Psyc 302, Fall 2009), Laurel Watkins (Undergraduate Biology Research Program, 2009- present), R'ind Wheeler (Summer Research Institute, 2010).

- Independent studies semesters: 49

University of Arizona (38, Honors thesis: 3), Duke University (6).

- Thesis committee member: 6

Drew Maurer (Neuroscience, PhD), Marco Herrera (Physiology, PhD), Erin McKiernan (Physiology, PhD), Angelique Paulk (Insect Science, PhD), Lise Johnson (Biomedical Engineering, PhD), Melinda Smith (Neuroscience, PhD).

Office hours

I hold 2 fixed office hours per class whether graduate or undergraduate. All independent studies meet with me one-on-one at least 1 hour biweekly. All students are encouraged to schedule separate appointments if they wish. Extra office hours are systematically scheduled a couple of days before midterms and final exams.

Mentoring and career counseling

I am regularly meeting students, at their request, to advise them on career paths to graduate school, medical school or industry jobs. One postdoctoral fellow obtained a faculty position. Since 2005, I have written confidential letter of recommendations for 16 graduate students, 16 undergraduate students, 4 postdoctoral fellows and 3 faculty.

Development and scholarly activity supporting teaching

All the classes I teach are based on lectures and Powerpoint slides. Most include sound files, movie clips and animations. I find the use of this technology very effective in communicating information, as long as animations and 'fluff' remain limited. This type of slide presentation is crucial to teaching neuroscience and biopsychology.

I develop and maintain a website for each of the classes that I teach (Psyc 302, Psyc 5/496L, Psyc 5/403, Psyc 506A). These websites are built from scratch (i.e. not D2L, which I tried and did not like) from pure HTML files to give me maximal flexibility in form and content. Lecture slides, syllabi, test solutions, homeworks, study guides, general class announcements and optional exercises are posted online weekly and webpages contain links to web resources worldwide. In some classes, these websites also contain data from my laboratory or from my colleagues and PDF files of published papers. This material is placed in secured areas accessible only to the students (Psyc 5/403, Psyc 5/496, journal clubs). Finally, since Psyc 5/403 and Psyc 5/496 include hands-on activities, I have purchased and am maintaining a dedicated wireless router for these classes, so that students can use their computer in class.

In Psyc302, I give a once-a-semester extra-credit if students commit to providing lecture notes for one of the lectures. These notes are posted on the website for all students to access. I found that the educational value of this activity is very large, and the response of the students is excellent (typically more than 4 students sign up per lecture).

Evaluation of Teaching and Teaching Portfolio

Student Evaluations of Teaching: Quantitative Summary

<i>Course title</i>	<i>Semester</i>	<i>Responses/enrollment</i>	<i>Overall teaching effectiveness</i>	<i>Overall rating of the course</i>
PSYC 302	Fall 2009	108/136	4.1 (4.0-4.2)	3.7 (3.7-3.9)
	Fall 2008	89/121	4.1 (4.0-4.2)	3.8 (3.7-3.9)
	Fall 2007	98/130	3.9 (4.0-4.2)	3.4 (3.7-3.9)
	Fall 2006	84/126	4.0 (4.0-4.2)	3.3 (3.7-3.9)
PSYC 506A	Fall 2009	16/17	4.5 (4.4-4.5)	4.3 (4.1-4.2)
PSYC 5/496L	Fall 2008	5/6	5.0 (4.2-4.3)	4.8 (3.9 4.0)
	Spring 2007	7/8	4.7 (4.4-4.5)	4.7 (4.1-4.2)
BME 265	Fall 2005	13/14	4.85 ± 0.38	4.54 ± 0.5
PSYC 5/403C	Fall 2007	10/15	4.7 (4.3-4.5)	4.1 (4.0-4.2)

Note: Numbers in parentheses are 95%CI from comparison groups

Note: BME 265 was taught at Duke University, and was the first version of PSYC 496L. No comparison data are available. Printout of evaluations and student's written comments are available upon request.

Student Evaluations of Teaching: Summary of students' written comments

Note: unless otherwise noted, text in bold are selected written comments from students taken from their anonymous end-of-semester surveys. All comments and originals are available upon request.

PSYC 302: Introduction to Biopsychology

Selected written comments from students (Fall 2009 only)

- **I just wanted to let you know that you did such a phenomenal job with that class. I don't think i took more information away from a class in my undergrad. career than yours; and I have been able to see it in full effect as to utilizing it outside of the classroom, with everyone ... (email sent 5/2010).**
- **Thank you for such a great semester. I really enjoyed your class and I learned a lot.**
- **The material was very interesting and was presented in an understandable way. This class inspired me to enroll in neurobiology for Spring 2010.**
- **The material covered was very interesting. I would definitely suggest this course to someone interested in neurobiology.**
- **This class was very interesting in large part b/c of the prof. He went out of his way to be fair + provide ample opportunities for office hours, extra-credit, and study sessions.**
- **Your lectures were a clear and concise representation of the reading material. I especially enjoyed the video examples that supplemented the lectures.**
- **Great use of videos!**
- **[I especially liked] the format and Organization. It was the best class I've had, and the subject was really interesting.**
- **The class challenged me to know the material in such a way as to be more applicable to everyday life.**
- **The [online] study guides were very helpful and the instructor was great at answering class questions.**
- **I like his lectures they are fun and interesting so they make stuff easier to learn.**
- **The notes online was very helpful.**
- **[I especially liked] the lectures and pop-quizzes because it made me stay on top of the material. The professor's teaching style & willingness to help was greatly appreciated and acknowledged.**

PSYC 302 is for a lot of students the first science class they have in college. The class is organized in three sections. The first is heavy in terminology and new concepts, and fairly dense. The second goes over the basic sensory modalities. The third goes over integrated and cognitive functions and brain disorders. I spend a significant amount of time and efforts making sure the 3 sections are consistent and that material is illustrated by actual examples, demonstrations, movies from patients and so on. I also make sure the webpage is updated weekly and contains additional information and links related to the specific topics covered that week. Students often send me links and info to be posted. The class is known to the students as being ‘difficult’, but as their comments and evaluations indicate, the vast majority of them acknowledged the fact that they have learned and benefitted from it. As such, I have made no attempt at ‘lowering the bar’ and decided to keep students challenged (and letting them know so), making sure that the grading remained fair and related to the difficulty of the material.

PSYC 506A: Computation in neural systems

Selected written comments from students (Fall 2009 only)

- **Student summaries were very helpful. You are an excellent presenter. I really learned a lot. This was a very interesting course.**
- **Jean-Marc presents the information well and is fun to learn from.**
- **The course material is important and interesting. Jean-Marc is an expert, and answers just about any question well.**
- **Interesting. Constant emphasis on computation.**

This was the first time I taught this class (first/second year graduate students, core course of the Cognition and Neural Systems track), taking over from Bruce McNaughton’s and David Euston. The course material is very heavy in concepts and principles, and surveys a large range of levels (molecular to systems) and areas (spinal cord to cortex). Because of this, students are sometimes a bit dizzy with new knowledge. I would argue however that this is in fact what is required if ones is to effectively address the issue of ‘neural computations’. I believe that the best way to get to basic principles is to understand them across description levels, behaviors and brain areas. I was lucky to have access to a lot of Bruce McNaughton and David Euston’s lecture material, and if allowed to teach this class again, intend to update, fine tune and restructure the lectures over the next couple of years. Also note that about 15% of the lectures were delivered by guest speakers colleagues from the Psychology Department and elsewhere. This was intentionally done to give students opportunities to learn from experts in their domains, change pedagogical pace, introduce diversity and familiarize students with other faculty’s research. Testing was about 70% on the material directly taught in class and 30% on critical thinking related to material related to but not explicitly covered during the lectures.

PSYC 5/496L: Introduction to Neural Data Analyses

Selected written comments from students (Fall 2008 and Spring 2007)

- **Dr. Fellous is able to teach complex and abstract concepts in a way that is understandable to any graduate or undergraduate student. I would recommend his class to any student interested in mathematics of neuroscience.**
- **Small class size was excellent**
- **I really enjoyed the small classroom atmosphere**
- **All applicable useful skills – should be mandatory**
- **The lectures presented difficult topics w/ a great deal of clarity. The class was driven by students’ individual interests especially w/ the lectures we presented.**
- **I felt that the discussion of the math underlying each type of data analysis was incredibly useful especially when specific examples were used to implement a technique step-by-step.**
- **I could use all the techniques I learned directly in my own graduate work, which was excellent since I am finishing up.**
- **neural data analysis makes a lot more sense without the heavy Math. Fantastic challenges in the homework. Very approachable instructor for any questions from class or Matlab coding. The course covered a lot more material than was necessary to do well in the exam.**

With the advent of new molecular techniques (e.g. immediate early genes), new electrophysiological techniques (e.g. high density multi-unit chronic recordings) and new imaging techniques (e.g. diffusion tensor imaging), neuroscientists are faced with the need to analyze ever growing amount of data per experiment. The quantitative skills of graduate students in Psychology and other disciplines in the life sciences need to be significantly improved if they are to make the most of the data they painstakingly gather. This new class aims at giving students

an introduction to the tools they can use to analyze their data smartly, beyond simple statistics. It is also aimed at bringing Applied Mathematics students to the field of Neuroscience. The class is hands-on and uses real data from my laboratory and others. Code is developed in Matlab, research papers are read and critically presented by the students. Students also conduct a term project related to their own research (if possible). The class contains focused theoretical components designed to lead to practical work. A current limiting factor to this class is the necessity for students to have some basic programming skills. I discussed this issue with the Computer Science Department and the School of Information Science Technology and Arts (SISTA) and obtained a very positive response: efforts will be made to provide a new class or tailor an existing one. Sadly, no textbook exist on the topic, so it is my intention to write one when time will permit.

PSYC 5/403c: Introduction to Computational Neuroscience

Selected written comments from students (Fall 2007 only)

- **The material was made extremely approachable. It is difficult material but I could understand it.**
- **Homeworks were great. Practice in software is great.**
- **The format was good w/ lecture, presentation, modeling**
- **The information was presented in a very straightforward way it was usually easy to understand. Readings were always relevant to the topic.**
- **I liked the small class size and the modeling was applied to past research**
- **I liked the format of the class that included theory and practice. I like that we all got to participate in class activities**

The complexity of the structure and dynamics of the nervous system is still well beyond our grasp. The past 20 years have seen a resurgence of mathematical and computational efforts aimed at better understanding the nature of neural computations, from the single cell to the network levels. The explanatory and predictive powers of computational models have proven to potentially change the way we study the brain. Unfortunately, computational work is intimidating mainly because it requires a set of skills (programming, logic, mathematics) typically not available to students in life sciences and Psychology. The aim of this class is to introduce students to computational neuroscience (biophysical modeling more specifically), and dispel the belief that this field is 'complicated'. As with Psyc 5/496, this class is also aimed at introducing Applied Mathematics students to neuroscience. We use a neural simulator that takes away much of the hard implementation and algorithmic work, and focuses the students on the problem at hand. There are a few textbooks available, but most quickly become too theoretical and abstract for the types of students targeted here. I therefore developed a set of lectures and computational modeling projects (with code) specifically for this class. Students have hands-on homeworks, in-class exercises, and a term project linked to their research (if possible). Again, as in PSYC 5/496L, the limiting factor for students is having some basic computational skills. I have found that online resources (tutorials) help tremendously, short of having SISTA provide a basic programming class.