

Curriculum Vitae

Michael J. Frank

University Address:

Brown University
190 Thayer St Box 1978
Providence RI 02912-1978
Michael_Frank@brown.edu
<http://ski.cog.brown.edu>

Home Address:

100 Wayland Ave #7
Providence, RI 02906
401.743.5573

Employment:

Jan 2009 -- Assistant Professor, Dept of Cognitive and Linguistic Sciences, Dept of Psychology, Dept of Psychiatry, Brown Institute for Brain Science, *Brown University*
Jan 2006 – Dec 2008 Assistant Professor, Dept of Psychology, Program in Neuroscience, Cognitive Science Program, *University of Arizona*

Degrees:

Ph.D., Neuroscience & Psychology (joint), University of Colorado at Boulder, 2004
Thesis: "Dynamic Dopamine Modulation of Striato-Cortical Circuits in Cognition."
Randall C. O'Reilly advisor.
M.S., Electrical Engineering (biomedicine), University of Colorado at Boulder, 2000
B.Sc., Electrical Engineering, Queen's University, Canada, 1997

Additional Education:

Postdoctoral Fellow, Department of Psychology & Center for Neuroscience, University of Colorado, 2005
John Merck Fund Summer Institute on Biology of Developmental Disabilities, Princeton University, 2004
Pure and Applied Science, Marianopolis College, Montreal, Canada, 1996

Research Interests:

Computational modeling of neural mechanisms underlying reinforcement learning, decision making, working memory and inhibitory control. I develop neural network and mathematical models of interactions between basal ganglia, frontal cortex, and hippocampus, and modulation of these brain areas by dopamine and other neuromodulators. I test theoretical predictions of the models using various neuropsychological, pharmacological, genetic, and neuroimaging techniques.

Awards and Honors:

Janet T Spence Award for Transformative Early Career Contributions, APS, 2010
D.G. Marquis Behavioral Neuroscience Award, best paper in Behavioral Neuroscience, 2006
Dozier Award for outstanding scholarly record, University of Colorado, 2004
UC Davis Center for Mind and Brain Conference Fellowship (4/2004)
University of Colorado Graduate Fellowship
Natural Sciences & Engineering Research Council graduate scholarship (Canada)
Senator Frank Carrel Upper Year Scholarship, Queen's University, 1994/95/96
Dean's Award, Queen's University, 1996
Dean's Scholar, Queen's University, 1994/95/96/97

Grants:

Orbitofrontal and striatal mechanisms in stress and addiction, NIDA R21 DA022630, 9/1/06-8/31/09, co-PI with Lesley Fellows (PI), \$210,000 direct costs (subcontract)

Clinical and computational studies of dopamine function in Schizophrenia, NIMH R01 MH080066-01, 01/01/08 – 12/31/12, co-PI with Jim Gold (PI), \$409,521 direct costs (subcontract)

Neurocognitive Computations in Parkinson's Disease
Michael J Fox Foundation for Parkinson's Research

1/1/2009 – 12/31/2011 Frank (PI), \$366,848 direct costs

Journal Articles:

Cavanagh, J., Frank, M.J., Klein, T.J., & Allen, J.J.B. (in press). Frontal theta links prediction errors to behavioral adaptation in reinforcement learning. *NeuroImage*.

Wiecki, T.V. and Frank, M.J. (in press). Neurocomputational models of motor and cognitive deficits in Parkinson's disease. *Progress in Brain Research*.

Frank, M.J., Doll, B.B, Oas-Terpstra, J. and Moreno, F. (2009). Prefrontal and striatal dopaminergic genes predict individual differences in exploration and exploitation. *Nature Neuroscience* 12:1062-1068.

Hazy, T.E., Frank, M.J. and O'Reilly, R.C. (in press). Neural mechanisms of acquired phasic dopamine responses in learning. *Neuroscience & Biobehavioral Reviews*.

Frank, M.J. and Hutchison, K. (2009). Genetic contributions to avoidance-based decisions: Striatal D2 receptor polymorphisms. *Neuroscience* 164:131-140.

Doll, B.B., Jacobs, W.J. , Sanfey, A.G and Frank M.J. (2009). Instructional control of reinforcement learning: A behavioral and neurocomputational investigation. *Brain Research* 1299:74-94

Chase, H.W., Frank, M.J., Albert, M., Bullmore, E.T., Sahakian, B.J. and Robbins, T.W (2009). Approach and avoidance learning in patients with major depression and healthy controls: Relation to anhedonia. *Psychological Medicine* 17:1-8.

Chatham, C., Frank, M.J. and Munakata, Y. (2009). Pupillometric and behavioral markers of a developmental shift in the temporal dynamics of cognitive control. *Proceedings of the National Academy of Science*, 106, 5529-33

Wiecki, T.V., Riedinger, K., Meyerhofer, A., Schmidt, W.J. and Frank, M.J. (2009). A neurocomputational account of catalepsy sensitization induced by D2-receptor-blockade in rats: Context-dependency, extinction and renewal . *Psychopharmacology*, 204, 265-77

Frank, M.J., Cohen, M.X. and Sanfey, A.G. (2009). Multiple systems in decision making: A neurocomputational perspective. *Current Directions in Psychological Science*, 18, 73-77.

Gründler, T.O.J., Cavanagh, J.F., Frank, M.J. and Allen, J.J.B. (2009). Task related dissociation in ERN amplitude as a function of obsessive-compulsive symptoms. *Neuropsychologia* 47, 1978.

Cools, R., Frank, M.J., Gibbs, S.E., Miyakawa, A., Jagust, W. and D'Esposito, M. (2009). Striatal dopamine predicts outcome-specific reversal learning and its sensitivity to dopaminergic drug administration. *Journal of Neuroscience* 29, 1538-1543.

Cohen, M.X. and Frank, M.J. (2009). Neurocomputational models of basal ganglia function in learning, memory and choice. *Behavioural Brain Research*, 199, 141-156.

Ragland, JD, Cools, R., Frank, M.J., Pizzagalli, D.A., Preston, A., Ranganath, C. And Wagner, A.D (2009). Cognitive neuroscience treatment research to improve cognition in schizophrenia (CNTRICS) final task selection: Long-term memory. *Schizophrenia Bulletin*, 35, 197-212

Santesso, D.L., Evins, A.E., Frank, M.J., Cowman, E.M. and Pizzagalli, D.A. (2009). Single dose of a dopamine agonist impairs reinforcement learning in humans: Converging evidence from electrophysiology and computational modeling of striatal-cortical function. *Human Brain Mapping* 30, 1963-1976.

Moustafa, A.A., Cohen, M.X., Sherman, S.J. and Frank, M.J. (2008). A role for dopamine in temporal decision making and reward maximization in Parkinsonism. *Journal of Neuroscience*, 28, 12294-12304.

Frank, M.J. (2008). Schizophrenia: A computational reinforcement learning perspective. *Schizophrenia Bulletin*, 34, 1008-1011.

Moustafa, A.A., Sherman, S.J. and Frank, M.J. (2008). A dopaminergic basis for working memory, learning, and attentional shifting in Parkinsonism. *Neuropsychologia*, 46, 3144-56.

Frank, M.J., O'Reilly, R.C. and Curran, T. (2008). Midazolam, hippocampal function, and transitive inference: Reply to Greene. *Behavioral and Brain Functions*, 4:5.

Frank, M.J. and Kong, L. (2008). Learning to avoid in older age. *Psychology and Aging*, 23: 392

Pizzagalli, D.A., Evins, A.E., Schetter Cowman, E., Frank, M.J., Pajtas, P.E., Santesso, D.L., and Culhane, M. (2008). Single dose of a dopamine agonist impairs reinforcement learning in humans: Behavioral evidence from a laboratory-based measure of reward responsiveness. *Psychopharmacology* 196, 221—232.

Frank, M.J., Samanta, J., Moustafa, A.A. and Sherman, S.J. (2007). Hold your horses: Impulsivity, deep brain stimulation and medication in Parkinsonism. *Science*, 318, 1309-1312.

Frank, M.J., Moustafa, A.A., Haughey, H.C., Curran, T. And Hutchison, K. (2007). Genetic triple dissociation reveals multiple roles for dopamine in reinforcement learning. *Proceedings of the National Academy of Sciences*, 104, 16311-16316.

Frank, M.J., D'Lauro, C., and Curran, T. (2007). Cross-task individual differences in error processing: Neural, electrophysiological, and genetic components. *Cognitive, Affective, and Behavioral Neuroscience* 7, 297-308.

Aron, A.R., Behrens, T.E., Smith, S. Frank, M.J. and Poldrack, R.A. (2007). Triangulating a cognitive control network using diffusion-weighted MRI and functional MRI. *Journal of Neuroscience*, 27, 3743-52.

Frank, M.J., Santamaria, A., O'Reilly, R.C. and Willcutt, E. G. (2007). Testing computational models of dopamine and noradrenaline dysfunction in attention-deficit/hyperactivity disorder. *Neuropsychopharmacology*, 32, 1583-99.

Frank, M.J., Scheres, A. and Sherman, S.J. (2007). Understanding decision making deficits in neurological conditions: Insights from models of natural action selection. *Philosophical Transactions of the Royal Society-B*, 362, 1641-54.

Hazy, T., Frank, M.J. and O'Reilly, R.C. (2007). Toward an executive without a homunculus: Computational models of the prefrontal cortex/basal ganglia system. *Philosophical Transactions of the Royal Society-B*, 362, 1601-13.

O'Reilly, R.C., Frank, M.J., Hazy, T. and Watz, B. (2007). PVLV: The Primary Value and Local Value Pavlovian Learning Algorithm. *Behavioral Neuroscience*, 121, 31-49.

Waltz, J., Frank, M.J., Robinson, B. and Gold, J. (2007). Selective reinforcement learning deficits in schizophrenia support predictions from computational models of striato-cortical dysfunction. *Biological Psychiatry*, 62, 756-764.

Frank, M.J. (2006). Hold your horses: A dynamic computational role for the subthalamic nucleus in decision making. *Neural Networks*, 19, 1120-1136

Frank, M.J. and Claus, E. (2006). Anatomy of a Decision: Striato-Orbitofrontal Interactions in Reinforcement Learning, Decision Making and Reversal. *Psychological Review*, 113, 300-326.

Frank, M.J. and O'Reilly, R.C. (2006). A mechanistic account of striatal dopamine function in cognition: Psychopharmacological studies with cabergoline and haloperidol. *Behavioral Neuroscience*, 120, 497-517.

Frank, M.J., O'Reilly, R.C. and Curran, T. (2006). When memory fails, intuition reigns: Midazolam enhances implicit inference in humans. *Psychological Science*, 17, 700-707.

O'Reilly, R.C. and Frank, M.J. (2006). Making working memory work: A computational model of learning in the frontal cortex and basal ganglia. *Neural Computation*, 18, 283-328.

Hazy, T., Frank, M.J. and O'Reilly, R.C. (2006). Banishing the homunculus: Making working memory work. *Neuroscience*, 139, 105-118.

Frank, M.J. (2005). Dynamic dopamine modulation in the basal ganglia: A neurocomputational account of cognitive deficits in medicated and nonmedicated Parkinsonism. *Journal of Cognitive Neuroscience*, 17, 51-72.

Frank, M.J., Woroach, B.S. & Curran, T. (2005). Error related negativity predicts reinforcement learning and conflict biases. *Neuron*, 47, 495-501.

Frank, M.J., Rudy, J.W., Levy, W.B. & O'Reilly, R.C. (2005) When logic fails: Implicit transitive inference in humans. *Memory and Cognition*, 33, 742-50.

Frank, M.J., Seeberger, L.C. and O'Reilly, R.C. (2004). By carrot or by stick: Cognitive reinforcement learning in Parkinsonism. *Science*, 306, 1940-3.

Atallah, H.E., Frank, M.J. and O'Reilly, R.C. (2004). Hippocampus, cortex and basal ganglia: Insights from computational models of complementary learning systems. *Neurobiology of Learning and Memory*, 82, 253-67.

Frank, M.J., Rudy, J.W., & O'Reilly, R.C. (2003). Transitivity, flexibility, conjunctive representations and the hippocampus: II: A computational analysis. *Hippocampus*, 13, 341-354.

Frank, M. J., Loughry, B. & O'Reilly, R. C. (2001) Interactions between frontal cortex and basal ganglia in working memory: A computational model. *Cognitive, Affective, and Behavioral Neuroscience*, 1 137-160.

Commentaries, Editorials, Book Chapters, Conference Proceedings:

Daw, N.D. and Frank, M.J. (2009) Reinforcement learning and higher level cognition:

Introduction to special issue. *Cognition*, 113, 259-261

Frank, M.J. and Surmeier, D.J. (2009). Do substantia nigra dopaminergic neurons differentiate between reward and punishment? *Journal of Molecular Cell Biology (JMCB)*, 1 15-16.

Frank, M.J. (2009). Slave to the striatal habit: Commentary on Tricomi et al. *European Journal of Neuroscience*, 29, 2223-4.

Doll, B.B. and Frank, M.J. (2009). The basal ganglia in reward and decision making: Computational models and empirical studies. Chapter in J.-C. Dreher and L. Tremblay, eds, *Handbook of Reward and Decision Making*, Oxford:Academic Press, pp399-425.

Frank, M.J. (2005). When and when not to use your subthalamic nucleus: Lessons from a computational model of the basal ganglia. *Modelling Natural Action Selection: Proceedings of an International Workshop*, 53-60.

Popular Press (non-peer reviewed):

Frank, M.J. (2007). "Go" and "NoGo" Learning and the Basal Ganglia. *Cerebrum* (<http://www.dana.org/news/cerebrum/detail.aspx?id=10376>)

Frank, M.J. and O'Reilly, R.C. (2005). Cognitive processes in Parkinson's disease: From dopamine to behavior. *Colorado Neurological Institute Review*, Fall 2005, pp. 3-9.

Scholarly Presentations:

Colloquia (Invited)

University College London, London UK, "Brain meeting", 2/5/10

University of Chicago, Center for Integrative Neuroscience and Neuroengineering, 1/19/10

Donders Institute for Brain, Cognition & Behaviour, Nijmegen, The Netherlands, 7/29/09

University of Zurich, Institute for Empirical Economics, Zurich, Switzerland, 6/4/09

Queen's University, Centre for Neurosience, Kingston Canada, 4/8/09

Northwestern University, Dept of Physiology Feinberg School of Medicine, Chicago IL, 3/13/09

Johns Hopkins University, Dept of Psychological & Brain Sciences, Baltimore Maryland, 2/11/09

University of Waterloo, Centre for Theoretical Neuroscience, Waterloo, Canada, 12/12/08

Tamagawa University, Tokyo, Japan, 10/15/08

University of Colorado, Institute for Cognitive Science, Boulder, CO, 7/30/08

Max Planck Institute, Neurocognition of Decision Making Group, Berlin Germany, 7/18/08

Laboratoire de la Neurobiologie de la Cognition, Université de Provence, Marseille, France, 7/15/08

Gatsby Computational Neuroscience Unit, University College London, London, UK, 6/4/08

University of Cambridge Behavioral Neuroscience seminar series, Cambridge, UK, 6/3/08

University of Michigan, Neurons, Brains and Models seminar series, Ann Arbor, MI, 4/10/08

Max Planck Institute, Cologne, Germany, 3/17/08

University of California at Davis Medical Center, MIND Institute, Davis CA, 2/28/08

Arizona Research Laboratories Division of Neurobiology seminar, Tucson AZ, 2/25/08

Brown University, Brain Sciences Program, Providence RI, 2/21/08

University of Delaware, Cognition and the Brain series, 10/5/2007.

Yale University, Swartz Initiative in Theoretical Neurobiology, New Haven, CT, 5/25/07

UCSD Temporal Dynamics of Learning Center, San Diego, CA, 5/18/07

Princeton University Neuroscience Institute, Princeton, NJ, 4/26/07

Mathematics Awareness Month, 'Mathematics and the Brain', U of Arizona, 4/17/07

Workshop on Computational Neuroscience, department of mathematics, Uof Arizona, 2/23/07

California Institute of Technology, Neuroeconomics seminar series, Pasadena CA 01/25/07

Ohio State University, dept of Psychology, Columbus OH 11/19/07

UCLA Dept of Psychology, Los Angeles, CA, 7/26/06
University of Bonn, Center for Life and Brain, Bonn Germany, 6/6/06
Institute for Cognitive Science Science of Learning series, University of Colorado, 9/30/05
Maryland Psychiatric Research Center, University of Maryland Medical School, 9/16/05
Center for Neuroscience Supergroup, University of Colorado, 9/23/04
Colorado State University behavioral & cognitive neuroscience brown bag, 9/24/04

Symposia and Workshops, Invited Talks

"Cortico-striatal interactions in reinforcement-based decision making: Multiple levels of modeling", UK Neuroinformatics Node Congress, Edinburgh, UK, 2/2/10

"Neurogenetic influences on learning from experience and executive control over learning", Genetic and Experiential Influences on Executive Function meeting, Boulder CO, 1/16/10

"Dopamine, reward processing, and decision making in aging", Aging, Motivation and Addiction meeting sponsored by NIDA and NIA, Washington DC, 10/5/09

"Hierarchical cognitive control in prefrontal-basal ganglia circuits", symposium on computational modeling (K Norman chair), Memory Disorders Research Society, Chapel Hill NC, 9/25/09

"Neurocomputational models of reinforcement learning: Implications for Parkinson's disease, pharmacology and genetic". Gordon Research Conference on Catecholamines, Biddeford ME 8/12/09

"Neurocomputational models of learning and decision making: Multiple levels of analysis". *keynote address*, Mathematical Psychology annual meeting, Amsterdam, The Netherlands, 8/2/09

"Fronto-subthalamic interactions in high conflict decisions and response inhibition: Computational and empirical studies", Symposium on neurocomputational models of speeded decision making (R Bogacz chair), Mathematical Psychology annual meeting, Amsterdam, The Netherlands, 8/2/09

"Computational neuroscience and empirical studies of reinforcement learning", 1st Annual NIMH-Sponsored Brain Camp, Cold-Spring Harbor, NY, 5/2/09

"The neurogenetics of exploration vs exploitation: Prefrontal and striatal dopaminergic components", workshop on Computational Role of Dopamine, (B Averbeck and M Frank, chairs) Computational and Systems Neuroscience (COSYNE) meeting, Snowbird UT, 3/2/09

"Neurocomputational and Genetic Components to Exploration vs Exploitation", symposium on mesocorticolimbic interactions in health and disease (A Gruber chair), Winter Conference on Brain Research, Copper Mountain Colorado, 1/29/09

"Fronto-subthalamic interactions in high conflict decisions and response inhibition: Computational and empirical studies", Symposium on the subthalamic nucleus (C Baunez chair), Winter Conference on Brain Research, Copper Mountain Colorado, 1/27/09

"Temporal Integration of Expected Utility: Neurocomputational and Genetic Components", Open Problems in Neuroscience of Decision Making, Okinawa, Japan, 10/16/08

"Neurogenocomputomics", symposium on Neuromodulation of Lifespan Cognition, International

Congress of Psychology, Berlin, Germany, 7/21/08

"Neurogenocomputomics", symposium on Computational Psychiatry, Lisbon, Portugal, 5/30/08

Interactive dynamics of corticostriatal circuits in behavioral adjustment", Workshop on "Action monitoring and behaviour adjustment", RWTH Aachen University, Aachen Germany, 3/15/08

"Interactive dynamics of corticostriatal circuits in reinforcement learning and decision making", Sustaining Performances Under Stress Symposium, University of Texas at Austin, Austin TX, 12/6/2007.

"Simulating dynamics between frontal cortex and subthalamic nucleus in high-conflict decisions and response inhibition", workshop on Translational Aspects of Stopping Movement and Action, UCSD, San Diego CA, 11/2/2007

"Neurocomputational models of frontostriatal function and dysfunction", Symposium on Computational Models of Biological Psychiatry, Computational Cognitive Neuroscience Conference, San Diego, CA, 11/1/2007

"Dynamics of frontal cortex and subthalamic nucleus in high-conflict decisions and response inhibition", workshop on neural mechanisms of stochastic decision making, Ohio State University, Columbus, OH, 9/11/2007.

"Interactive dynamics of corticostriatal circuits in reinforcement learning and decision making", in K. Gurney (Chair), "*Computational Models of the Basal Ganglia: From Molecules and Membranes to Behaviour and Cognition*". Symposium conducted at the 9th Triennial Meeting of the International Basal Ganglia Society, 9/6/2007

"Dopamine and reward calculation", Charité conference on Emotional Neuroscience, Berlin, Germany, 9/1/2007

"Interactive dynamics of striato-cortical circuits in reinforcement learning and decision making", in C. Holroyd (Chair) "*The Cognitive Neuroscience of Decision Making*". President's Symposium conducted at the Canadian Society for Brain, Behaviour and Cognitive Science, University of Victoria, Victoria, BC, 6/16/2007

"Interactive dynamics of striato-cortical circuits in reinforcement learning and decision making", Perceptual Expertise Network meeting, Yale University, 4/20/07

"The computational roles of dopamine in reinforcement learning and decision making". in J. Cohen (Chair) "*Has Reinforcement Learning Come of Age?*" Symposium conducted at the Psychonomic Society Annual Meeting, Houston TX, 11/17/06

"Evidence for a dynamic computational role of the subthalamic nucleus in decision making", in B. Knutson (Chair) "*Motivation and Emotion: Decision-Making*" Symposium conducted at the Society for Neuroscience Annual Meeting, Atlanta Georgia, 10/15/06.

"Interactive dynamics of striato-cortical circuits in reinforcement learning", workshop on the Role of Medial Frontal Cortex in Cognitive Control and Performance Monitoring, Amsterdam, the Netherlands, 6/10/2006

"Dynamic Dopamine Modulation of Striato-cortical Circuits in Reinforcement learning and

Decision Making", Betty Behrens Symposium on Neural Mechanisms for Regulating Behaviour, University of Cambridge, Cambridge, UK, 8/4/2005.

"When and When Not to Use Your Subthalamic Nucleus: Lessons from a Computational Model of the Basal Ganglia", International workshop on Models of Natural Action Selection, Edinburgh, Scotland, 7/30/2005.

"Computational Perspectives on Schizophrenia: Dysfunctional Dopamine Modulation of Striato-Cortical Circuits", Cold Spring Harbor Laboratory workshop on schizophrenia and related disorders, Cold Spring Harbor, New York, 7/16/2005.

"Computational Models of Striato-Cortical Circuits in Cognition: Recent Advances and Converging Empirical Evidence." workshop on Basal Ganglia, Dopamine and Learning: Integrating Computational and Clinical Perspectives in Jerusalem, Israel, 6/29/2005.

"Modeling Cognitive Deficits in Medicated and Non-medicated Parkinson's Disease." Cognitive Neuroscience of Category Learning conference, New York, NY, 10/10/2004.

"Basal Ganglia and Dopamine in Cognition: Network Models and Behavioral Studies." John Merck Fund Summer Institute for the Biology of Developmental Disabilities, Princeton University, 7/22/2004.

Media Coverage:

Interviews for news articles (see <http://ski.cog.brown.edu/inthenews.html> for detailed list)

Guest on Science Magazine Podcast, 10/07

Guest on National Public Radio (NPR) "Science Friday" <http://www.sciencefriday.com>, 7/24/09

Professional Activities:

Memberships

Association for Psychological Science

Cognitive Neuroscience Society

International Basal Ganglia Society

Society for Neuroscience

Editorial

- Guest editor (with Nathaniel Daw), special issue of *Cognition*, Reinforcement learning, 2009.
- Contributing Editor, European Journal of Neuroscience, 2008 - present
- Contributing Member, Faculty of 1000 Biology (www.f1000biology.com), Theoretical Neuroscience section, 2008- present
- Consulting Editor, Journal of Mathematical Psychology, Jan 2010-

Reviewing (*Grants; ad-hoc*)

NSF Proposal Reviewer

NIH internal reviewer for University of Arizona neuroscience training grant

NWO (Netherlands Organisation for Scientific Research)

Neurological Foundation of New Zealand

Parkinson's Disease Society of the UK

The Wellcome Trust

UK Economic and Social Research Council

Reviewing (*Publications; ad-hoc*)

American Journal of Psychiatry, Behavioural Brain Research, Behavioural Processes,

Biological Psychiatry, Brain, Brain Research, Cerebral Cortex, Cognition, Cognitive Affective and Behavioral Neuroscience, Cognitive Science Society Annual Meeting, Cambridge Handbook on Computational Cognitive Modeling, European Journal of Neuroscience, Frontiers in Behavioral Neuroscience, Frontiers in Computational Neuroscience, Handbook of Basal Ganglia Structure and Function, Hippocampus, Journal of Cognitive Neuroscience, Journal of Computational Neuroscience, Journal of Neurology, Journal of Neurophysiology, Journal of Neuroscience, Memory & Cognition, Movement Disorders, Neural Computation, Neural Networks, Neurobiology of Aging, NeuroImage, Neuropsychologia, Neuroscience & Biobehavioral Reviews, Perception & Psychophysics, Proceedings of the National Academy of Sciences, Psychological Review, Psychological Science, Psychonomic Bulletin & Review, Psychopharmacology, Public Library of Science (PloS) Biology, Science, Topics in Cognitive Science

Professional Service

- Co-organized workshop on "The computational role of dopamine", Computational and Systems Neuroscience (Cosyne 2009), Snow Bird Utah, 3/2/2009
- Organized symposium on "Computational models of biological psychiatry" at the Computational Cognitive Neuroscience Conference, San Diego, 11/2/2008
- Provide assistance to researchers using neural modeling software for simulating basal ganglia interactions in learning and associated neurological dysfunction (2005 – present)
- Panel member, Cognitive Neuroscience Treatment Research for Improving Cognition in Schizophrenia (CNTRICS)
- Participated in Deep Brain Stimulation (DBS) Consensus Conference to provide recommendations for patients with medically intractable Parkinson disease to patients and physicians. Advised on cognitive disturbances of medication and DBS. 4/2 – 4/3, 2009, New York, NY.

Teaching

Cognitive Control Functions of the Prefrontal Cortex, Spring 2010
Computational Cognitive Neuroscience, Fall 2009, Spring 2007, 2008
Reinforcement Learning, graduate seminar, Fall 2007
Seminar on Computational Approaches to Cognitive Neuroscience, Fall 2006
Computational Cognitive Functions of the Prefrontal Cortex, graduate seminar, Spring 2006

Guest Lecturer: Systems Neuroscience, Fall 2009
Advanced Cognitive Neuroscience, Spring 2009
Foundations in Cognitive Psychology, Spring 2006, 2007, 2008

Supervision

Mike Cohen (Postdoctoral 2008-2009)
Ahmed Moustafa (Postdoctoral 2006-2007)
Shikhar Kumar, graduate student, Fall 2007 - present
Brad Doll, graduate student, Spring 2007 – present
Jeff Cockburn, graduate student Fall 2009 – present
Jim Cavanagh, shared graduate student, Spring 2007 - present
Minryung Song, graduate lab rotation, Fall 2008
Christina Figueroa, research assistant Fall 2007 - present
Thomas Wiecki, researcher, Spring 2009 - present

Undergraduate independent study:

Mary Kim, Spring 2006, Parkinson's behavioral testing
Evan Carter, Spring 2007, basal ganglia modeling
Ariel Skalina, Spring 2007, behavioral experiments

Daniel Butler, Spring 2007, immunocytochemistry, striatum
Sarah Williamson, Fall 2007, decision making and genetic correlates.
Andrew Florez , Spring 2008, reward and decision making
Christina McGrory, Spring 2008, reward and decision making.
Sarah Hersman, 2009-2010 Honors thesis, hierarchical reinforcement learning and PFC

Other Work Experience:

PREDICTION COMPANY

June 2001 - June 2003

Santa Fe, New Mexico
(consultant office in Boulder, CO)

Software Developer and Research Consultant

- Designed and developed neural network software for detecting stock market patterns

UNIDEN SAN DIEGO R&D CENTER

San Diego, CA

October 1997- August 1998

Staff engineer

- Systems Integration and Test Engineer, hardware and software design for cellular phone.

MONTREAL NEUROLOGICAL INSTITUTE

Montreal, Quebec

May 1996 - August 1996

Biomedical engineering research assistant

- Developed software to manipulate magnetic resonance images (MRI) for analysis of epileptic brain anatomy and to map electroencephalogram (EEG) activity on the MR images.

Personal Information:

Born: November 22, 1974 in Montreal, Quebec, Canada