

Samuel Feng

Khalifa University
Department of Applied Mathematics
PO Box 127788
Abu Dhabi, United Arab Emirates

Phone: +971 55 510 3329
Email: fengman@gmail.com
Homepage: <http://www.samuelfeng.com>

Academic Positions and Experience

Assistant Professor, Department of Applied Mathematics and Sciences. Khalifa University, 2014 –
Postdoctoral Research Fellow, Princeton Neuroscience Institute, Princeton University, 2012-2014.

Adviser: Jonathan Cohen

Research Focus: Non-Gaussian noise processes in neural population models of decision making.

Ph.D. Applied Mathematics, Princeton University, 2012.

Adviser: Philip Holmes

Dissertation: Extensions and applications of stochastic accumulator models in attention and decision making.

Visiting scholar, King Abdullah University of Science and Technology, 2010.

Adviser: David Keyes

Research Focus: Numerical methods for Cahn-Hilliard PDE, emphasis on spectral methods

M.A. Applied Mathematics, Princeton University, 2009.

Adviser: Ingrid Daubechies

Research Focus: ℓ_1 regularization of linear inverse problems

B.A. Computational and Applied Mathematics, Rice University, 2007.

Advisers: Steve Cox, McKay Hyde, Mark Embree

Research Focus: Single cell inverse problems in mathematical neuroscience.

Research Interests

Probability, statistics, and machine learning

Stochastic models of decision making

Scientific computing

Limitations on artificial and human intelligence

Reports and Publications

Reports in Review

Feng S, Holmes P. *Will big data yield new mathematics? An evolving synergy with neuroscience.* In review.

Srivastava V, Feng S, Cohen JD, Leonard NE, Shenhav A. *First Passage Time Properties for Time-Varying Diffusion Models: A Martingale Approach.* In review. <http://arxiv.org/abs/1508.03373>.

Feng S. *The speed-accuracy trade-off in the drift diffusion model with a generalized noise process.* In review.

Feng S. *Reward rate based analysis of a foraging task.* In review.

Reports and Publications

Schwemmer M, Feng S, Holmes P, Cohen J. (2015) *A multi-area stochastic accumulator model for a covert visual search task.* PLoS One 10(8):e 0136097. doi:10.1371/journal.pone.0136097

Feng S, Schwemmer M, Gershman S, Cohen J. (2014) *Multitasking vs. multiplexing: Toward a normative account of limitations in the simultaneous execution of control-demanding behaviors*. Cognitive, Affective, & Behavioral Neuroscience. doi: 10.3758/s13415-013-0236-9.

Feng S. (2012) *Extensions and applications of stochastic accumulator models in attention and decision making*. Ph.D Thesis, Princeton University, Program in Applied and Computational Mathematics.

Feng S, Holmes P, Rorie A, Newsome WT. (2009) *Can monkeys choose optimally when faced with noisy stimuli and unequal rewards?* PLoS Comput Biol 5(2): e1000284. doi:10.1371/journal.pcbi.1000284.

Feng S, Isaac T, Xiao N. (2006) *A simulation-driven approach for a cost-efficient airport wheelchair assistance service*. The UMAP Journal. Vol 27. No. 3.

Invited Talks, Posters, and Presentations (denotes undergraduate advisee)*

Bornstein A, Aly M, Feng S, Turk-Browne NB, Norman KA, Cohen JD. *Memory-guided perception: Sampling from past experience during perceptual inference*. 45th Annual Society for Neuroscience Meeting. Chicago, Illinois, USA. October 2015.

Shrivastava V, Feng S, Shenhav, A. *Performance metrics for time-varying drift and other diffusion based models for decision making*. Second Multidisciplinary Conference on Reinforcement Learning and Decision Making. Edmonton, Alberta, Canada. June 2015.

Feng S. *Numerical methods for computing performance metrics in mult-stage and jump type diffusion models in decision making*. Computational and System Neuroscience (Cosyne) 2015 workshop on Random Walk Models Across Decision-Making Domains. Salt Lake City, Utah, USA. March 2015.

Feng S. *Connecting data and theory: stochastic accumulators in the neuroscience of decision making*. Optimal Decision-Making in Economics, Healthcare, and Sustainable Ecosystems Workshop, Khalifa University. Abu Dhabi, UAE. Dec 2014.

Voina D*, Feng S, Shenhav A, Cohen JD. *Fitting diffusion models to value based decisions*. Cognitive Neuroscience Society Annual Meeting. Boston, MA, USA. April 2014.

Feng S. *The neural dynamics of (almost) optimal decisions*. AMS Sectional Meeting. Special Session on Mathematical Biology, I. Philadelphia, PA, USA. October 2013.

Feng S. *Open problems in stochastic accumulators (and how to solve them)*. Khalifa University, Department of Applied Mathematics Colloquium. Abu Dhabi, UAE. April 2013.

Feng S, Schwemmer M, Gershman S, Cohen JD. *Capacity constraints on cognitive control*. Society for Neuroscience Annual Meeting. Washington, D.C., USA. November 2011.

Feng S. *Monkeys choosing between unequal rewards*. Princeton Applied Math Graduate Student Seminar. Princeton, NJ, USA. Spring 2010.

Feng S, Hwong R, Xiao N, Cox SJ. *Inverse problems in neuronal calcium signaling*. Mathematical Neuroscience Workshop, Center of Mathematics Research. University of Montreal, Albera, CAN. September 2007.

Feng S, Isaac T, Xiao N. *A simulation-driven approach for a cost-efficient airport wheelchair assistance service*. Mathematical Association of America Mathfest. Knoxville, TN, USA. August 2006.

Feng S, Bluemel C, Ganesh D, Stalder K. *Discontinuous Galerkin Methods for the 1-D Spherical Neutron Transport Equation*. Center for Applied Scientific Computing, Lawrence Livermore National Lab. Livermore, CA, USA. July 2005.

Feng S, Hwong R, Xiao N, Cox SJ. *Simulated calcium dynamics in a network of hippocampal pyramidal neurons*. Knerim Lab Colloquium. University of Houston, Houston, TX, USA. March 2005.

Funding

El-Fouly T, El-Dakkak O, Zahawi B, Feng S. Investigator for *Novel Nonparametric Models to Assess the Impact of Integrating Renewable Energy Resources into The Smart Grids*. Khalifa University Internal Research Fund Level 1. 191000 AED \approx 51,990 USD.

Khalaf K, Alsafar H, Christoforou N, Feng S, Al-Anouti F, AlHammadi R, Kalil A, Darwich N, Blackmore A.

Obesity in the UAE Youth From OMICs to Function: Towards the Early Prediction of Associated Chronic Disease.
Abu Dhabi Education Council (ADEC) Award for Research Excellence. 434314 AED \approx 118,280 USD.

Industry Collaboration

KUSTAR representative for Etihad-KU-EBTIC working group on Data Analytics

Teaching and Mentoring

Calculus 1 (Instructor and Course Coordinator, 2 sections), Khalifa University, Fall 2015.

Engineering Statistics (Instructor), Khalifa University, Spring 2015.

Calculus 1 (Instructor, 2 sections), Khalifa University, Fall 2014.

Quantitative Methods: Problem Solving in Mathematics (Instructor), Freshmen Scholars Institute, Princeton University, Summer 2013.

Research mentor of Doris Voina (Applied Mathematics Undergraduate), with Amitai Shenhav (Princeton Neuroscience Institute), Summer 2013.

Models in Mathematical Neuroscience (Assistant in Instruction), Princeton University, Spring 2011.

Quantitative Methods (Preceptor), Freshmen Scholars Institute, Princeton University, Summer 2011.

Research mentor for Reuben Martinez for Ronald E. McNair Program, Rider University, 2011.

Models in Mathematical Neuroscience (Grader), Princeton University, Spring 2010

Magic of Numbers (Instructor: Manjul Bhargava) Preceptor, Princeton University, Spring 2010

Game Theory (Instructors: Ingrid Daubechies and Robert Calderbank) Assistant in Instruction, Spring 2009.

Assistant in Instruction, Math Alive, Spring 2009

Assistant in Instruction, Models in Mathematical Neuroscience, Fall 2008

Professional Activities and Service

Khalifa University Applied Mathematics Representative, Najah Exhibition, Abu Dhabi National Exhibition Centre, October 2015

Volunteer for Math Clinic, Khalifa University, Fall 2014 – Spring 2015

Frontiers in Computational Neuroscience, Review/Editorial Board, 2013 –

Society of Industrial and Applied Mathematics, Member 2011 –

American Mathematical Society, Member 2011 –

PACM Graduate Student Representative, 2007-2012

Society for Neuroscience, Member 2011-2012

Graduate Student Seminar, Organizer, 2009-2010

Organizer of PACM Regional Conference, 2009

Graduate Student Committee, 2007-2011

President Rice SIAM chapter 2006-2007

Honors, Awards, and Fellowships

Ruth L. Kirschstein National Research Service Award Postdoctoral Fellowship (2012-2014)

Princeton C.V. Starr Fellowship 2007-2008

Founder/member of Rice's 'Outstanding' team, the highest honor given at Mathematical Contest in Modeling 2006 (top 15/748 teams designated 'Outstanding')

MAA prize, Mathematical Contest in Modeling, 2006

Rice Engineering Alumni award 2005

Louis J. Walsh Scholarship 2005

Halliburton Scholarship 2003-2007

Computer Skills

Operating Systems: Unix/Linux (Various distributions), Windows XP/Vista/7, Mac OS 10.4+

Programming Languages: C, C++, Python, Bash/C Shell, Matlab, Mathematica, R, HTML, CSS, Fortran 77/90+, Java

Software packages: Open MPI, OpenMP, Intel MKL compilers, VisIt

All references available upon request.

Last updated: January 4, 2016