Yuan Liu (Sophie)

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EDUCATION AND TRAINING

- Postdoctoral Fellow, Computational Neurobiology Laboratory, The Salk Institute for Biological Studies, La Jolla, CA 2007-present
  Advisor: Tatyana Sharpee
- PhD in Physics, Program of Neuroscience, Princeton University, Princeton, NJ August 2007
  Advisors: Philip Holmes and William Bialek
  Thesis: Models and Dynamical Analyses of Neural Systems for the Eriksen Decision Task
- BS in Physics with Honors, California Institute of Technology, Pasadena, CA June 2002

RESEARCH INTERESTS

- Spatial-temporal receptive field that maximize information transmission
- Information theoretical model of population coding
- Dynamical system analysis on stochastic differential equations and Bayesian probabilistic models of neural network
- Data analysis of physiological and behavioral experiments on neuroscience

PUBLICATIONS

- Y. S. Liu, C. Stevens, and T. Sharpee, Predictable irregularities in retinal receptive fields, *Proc Natl Acad Sci USA* 106(38): 16499-16504, 2009
- Y. S. Liu, A. Yu, and P. Holmes, Dynamical Analysis of a Bayesian Inference Model for the Eriksen task, *Neural Computation* 21(6):1520–1553, 2009
- Y. S. Liu, P. Holmes and J.D. Cohen, A neural network model of the Eriksen task: Reduction, analysis, and data fitting, *Neural Computation* 20(2):345-373, 2008.
- Y. S. Liu, G.A. Cecchi, A.R. Rao, J. Kozloski and C.C. Peck, Inference and Segmentation in Cortical Processing, *Proc. SPIE Human Vision and Electronic Imaging XI,* 6057:23-26, 2006

PREPRINTS

- Y. S. Liu, P. Holmes, and J.D. Cohen, A Bayesian inference model for sequential effects in the Eriksen task, 2007

CONFERENCE PRESENTATIONS

- Y. S. Liu, Models and Dynamical Analyses of Neural Systems for a Decision Making Task, *International Symposium on Computational Neuroscience, Beijing, China*, 2009
- Y. S. Liu, and T. Sharpee, Imperfect receptive field organization can enhance performance of neural populations, *Computational and Systems Neuroscience, Salk Lake City, UT, USA*, 2009

- Y. S. Liu, and T. Sharpee, Mosaics of retinal ganglion cell receptive fields that maximize information transmission, *Society for Neuroscience Annual Meeting, Washington, DC, USA,* 2008
- Y. S. Liu, and T. Sharpee, Mosaics of retinal ganglion cell receptive fields that maximize information transmission, *Genes, Circuits and Behavior: A Symposium on Biological Complexity, La Jolla, CA, USA,* 2008
- Y. S. Liu, A. Yu, and P. Holmes, Dynamical Analysis of a Bayesian Inference Model for the Eriksen task, *Computational and Systems Neuroscience, Salt Lake City, UT, USA*, 2007
- Y. S. Liu, A. Yu, and P. Holmes, Connections between Neural Network Models and Probabilistic Models, *American Physical Society March Meeting, Denvor, CO, USA*, 2007
- Y. S. Liu, A. Yu, and P. Holmes, Dynamical System Analysis of a Bayesian Inference Model, *Neural Information Processing Systems (workshop), Whistler, Canada*, 2006
- Y. S. Liu, and P. Holmes, A Neural Network Model of the Eriksen Task: Analysis and Simulations, *Computational and Systems Neuroscience, Salt Lake City, USA*, 2006
- Y. S. Liu, and P. Holmes, Dynamical system analysis of a neural network model for the Eriksen Task, *American Physical Society March Meeting, Baltimore, USA*, 2006

INVITED TALKS

- "Information Maximization in Retinal Processing", *California State University, San Marcos, CA,* 2008
- "Decision Making: from Bayesian Updating to Drift Diffusion Process", *Albert Einstein College of Medicine, NY,* 2007
- "Decision Making: from Bayesian Updating to Drift Diffusion Process", *Sloan-Swartz Center For Theoretical Neurobiology Seminar, Salk Institute, CA,* 2007
- "Connections between Probabilistic Models and Connectionist Models in Cognitive Decision Making Tasks", *Yale University, CT,* 2007
- "Decision Making: from Bayesian Updating to Drift Diffusion Process", *Dynamical Systems and Non-linear Science Seminar, Princeton University, NJ,* 2007
- "Neural Basis of Concept Representation of 'Nest' in Mice", *Princeton Molecule Biology Retreat, Hershey, PA*, 2004

SELECTED HONORS & DISTINCTIONS

- Pioneer Postdoctoral Fellowship Award, Salk Institute, 2009
- Dean's Travel Fund, Princeton University, 2007
- Compton Grant, Department of Physics, Princeton University, 2005-2007
- Princeton University Fellowship, Princeton University, 2002-2003
- CIT International Scholarship, Caltech, 2001-2002
- Wylie W&M Scholarship, Caltech, 2000-2001
- Richter Scholarship - Paul K. and Evalyn Elizabeth Cook Richter Memorial Funds, Caltech, 2001
- Ming De Scholarship, Peking University, 1999-2000
- Yu Xi Scholarship, Peking University, 1998-1999
- Gold Medal and Best Female Contestant in 29th International Physics Olympiad, Rekjavik, Iceland, 1998

- Composition *Peace and Happiness* was issued as a stamp by People's Post of China, 1987

TEACHING EXPERIENCE

Princeton University

- TA for MOL/APC360 Biological Dynamics 2004-2007
- TA for MAE221/224 Thermodynamics 2005-2006
- TA for PHY103/104 General Physics I & II 2003-2004

California Institute of Technology

- TA for ACM95/100 Introductory Methods of Applied Mathematics 2001-2002
- Dean's Tutor for Ph106abc Topics in Classical Physics 2001-2002

WORKING EXPERIENCE

- IBM T.J. Watson Research Center, Yorktown Heights, NY, internship, Jun.-Aug. 2005
- Shanghai East Morning Newspaper, China, part-time column specialist, Sep. 2004-Jan. 2006
- Levono Online School, China, part-time editor, 1998-2000

ACTIVITIES

- Member of Society of Research Fellows, Salk Institute, 2007-present
- 1016 Drama Studio, Director, Princeton University, 2005-2007
- GSG (Graduate Student Government) representative, Princeton University, 2003-2004
- Vice President and Social Chair of Association of Chinese Students and Scholars, Princeton University, 2002-2004
- Member of Caltech C, Caltech Y, Caltech, 2000-2002

REFERENCES

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Charles Stevens
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Philip Holmes
Professor of Applied Mathematics, Princeton University
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