STANFORD UNIVERSITY SCHOOL OF MEDICINE
DEPARTMENT OF NEUROBIOLOGY

HHMI
HOWARD HUGHES MEDICAL INSTITUTE

299 Campus Dr. West
Fairchild Bldg., D200
Stanford, CA 94305

Dr. David Sheinberg
Department of Neuroscience
Brown University
Providence, RI 02912

Dear Dr. Sheinberg,

I am writing to apply for the position of Assistant Professor in the area of Computational Neuroscience. The attributes of my academic experience that make me well qualified for this position include my strong research record in computational neuroscience with a focus on cognitive processes and the effects of neuromodulators that play a role in neurological disorders, and my experience in and commitment to research mentorship and teaching.

Currently, I am a Howard Hughes Medical Institute research associate at Stanford University School of Medicine, working with Dr. Tirin Moore to explore the influences of reward and dopamine on target selection and attention. With a background in physics, I started my research in the area of computational neuroscience under the supervision of Dr. Xiao-Jing Wang at Brandeis University and later at Yale University, focusing on the neural mechanisms underlying value-based decision making. During my postdoctoral work at Caltech, under the supervision of Dr. Christof Koch, I investigated the neural mechanisms underlying attentional processes. Since then, I have applied my modeling expertise to explore a wide range of questions in cognitive neuroscience, in collaboration with experimentalists who use a variety of methods such as primate electrophysiology, behavioral economics, and human MEG and fMRI.

I greatly appreciate and welcome the collaborative aspects of this position, which are essential to my future research goals and build on my past experience. I believe that my expertise brings new teaching and collaborative research opportunities to the Department of Neuroscience and the Brown Institute for Brain Science.

Please find the attached application materials. I can be reached via email at asoltani@stanford.edu or by phone at (781) 801-0957. Thank you for your consideration and I hope to hear from you soon.

Sincerely,

A. Soltani

Alireza Soltani, Ph.D.

Alireza Soltani

Stanford University School of Medicine

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ACADEMIC POSITIONS AND EXPERIENCE

2011-present Howard Hughes Medical Institute Research Associate
Stanford University School of Medicine, Stanford, CA
Supervisor: Tirin Moore, Ph.D.

2009-2011 Postdoctoral Associate, Department of Neuroscience
Baylor College of Medicine, Houston, TX
Supervisor: Read Montague, Ph.D.

2007-2009 Postdoctoral Scholar, Division of Biology
California Institute of Technology, Pasadena, CA
Supervisor: Christof Koch, Ph.D.

2006-2007 Postdoctoral Associate, Department of Neurobiology
Yale University School of Medicine, New Haven, CT
Supervisor: Xiao-Jing Wang, Ph.D.

EDUCATION

2002-2006	Ph.D., Physics (Computational Neuroscience)	**Brandeis University**, Waltham, MA Research Fellow (2003-2006) *Advisor: Xiao-Jing Wang, Ph.D.*
1998-2000	M.S., Physics (Theoretical Physics)	**Sharif University of Technology**, Iran *Advisor: Farhad Ardalan, Ph.D.*
1994-1998	B.S., Physics	**Sharif University of Technology**, Iran

PUBLICATIONS

Dissertation (2006) – Neural Mechanism Underlying Reward-dependent Choice Behavior: A Cortical Network Model of Probabilistic Decision Making.

Journal Articles

Soltani A, Noudoost B, and Moore T. "Dissociable Dopaminergic Mechanisms Control Where to Look: Implications for Reward Modulation". *Under review in PNAS*.

Soltani A, Schafer RJ, Burrows BE, and Moore T. "Separable Influences of Reward on Prefrontal Control of Attention and Target Selection". *Under revision in Nature Neuroscience*.

Soltani A, De Martino B, and Camerer C (2012). "A Range-normalization Model of Context-dependent Choice: A New Model and Evidence". **PLoS Computational Biology** (*accepted*).

Hunt LT, Kolling N, Soltani A, Woolrich MW, Rushworth MFS, and Behrens TEJ (2012). "Mechanisms Underlying Cortical Activity During Value-guided Choice". **Nature Neuroscience**, 15(3): 470–476.

Soltani A and Koch C (2010). "Visual Saliency Computations: Mechanisms, Constraints, and the Effect of Feedback". **Journal of Neuroscience**, 30(38): 12831–43.

Soltani A and Wang X-J (2010). "Synaptic Computation Underlying Probabilistic Inference". **Nature Neuroscience**, 13(1): 112–9.

Soltani A and Wang X-J (2008). "From Biophysics to Cognition: Reward-dependent Adaptive Choice Behavior". **Current Opinion in Neurobiology**, 18(2): 209–16.

Soltani A, Lee D, and Wang X-J (2006). "Neural Mechanism for Stochastic Behavior During a Competitive Game". **Neural Networks**, 19(8): 1075–90.

Soltani A and Wang X-J (2006). "A Biophysically-based Neural Model of Matching Law Behavior: Melioration by Stochastic Synapses". **Journal of Neuroscience**, 26(14): 3731–44.

Manuscripts in Preparation

Soltani A and Wang X-J. "Learning and Representation of Prior Probability in a Neuronal Model of Decision Making". In preparation.

Soltani A and Montague R. "Effects of Energy Constraints on the Pattern of Neural Activity in the Brain". In preparation.

Published Abstracts

Soltani A, Noudoost B, and Moore T (2012). "Dissociable Influences of D1 and D2–mediated Frontal Eye Field Activity on Target Selection". *Computational and Systems Neuroscience*

Soltani A, Schafer RJ, Burrows BE, and Moore T (2012). "Separable Influences of Reward on Prefrontal Control of Attention and Target Selection". *Computational and Systems Neuroscience*

Soltani A and Montague R (2011). "Effects of Energy Constraints on the Pattern of Neural Activity in the Brain". *Society for Neuroscience*

Burrows BE, Soltani A, Schafer RJ, Koch C, and Moore T (2011). "Effects of Reward and FEF Microstimulation on Choice and Visually Guided Saccades During a Free-choice Task". *Society for Neuroscience*

Hunt LT, Kolling N, Soltani A, Woolrich MW, Rushworth MFS, and Behrens TEJ (2011). "Predicting Temporal Dynamics of Human Value-based Choice from a Cortical Attractor Network Model". *Computational and Systems Neuroscience*

Soltani A, De Martino B, Rangel A, and Camerer C (2010). "A Neuronal Model for Context-dependent Change in Preference". *Computational and Systems Neuroscience*

Soltani A and Koch C (2009). "Visual Saliency Computations and the Role of Feedback from Higher Visual Areas". *Society for Neuroscience*

Soltani A and Koch C (2008). "Spiking Network Model of Visual Saliency in Visual Cortex". *Society for Neuroscience*

Soltani A and Wang X-J (2007). "Bayesian Inference with Stochastic Synapses: A Neural Model of Probabilistic Decision Making". *Computational and Systems Neuroscience*

Lo C-C, Soltani A, and Wang X-J (2007). "Tuning Ramping Activity and Reaction Time by Balanced Synaptic Input in a Decision Making Circuit". *Computational and Systems Neuroscience*

Soltani A and Wang X-J (2006). "Bayesian Inference with Stochastic Synapses in a Decision Circuit: A Neural Model of Probabilistic Categorization Task". *Society for Neuroscience*

Carter GC, Soltani A, and Wang X-J (2006). "Learning and Representation of Prior Probability in a Neuronal Model of Decision Making". *Society for Neuroscience*

Soltani A and Wang X-J (2005). "Exploring Neural Mechanisms of a Mixed-strategy: A Microcircuit Model of Random Decision Dynamics in Competitive Games". *Society for Neuroeconomics*

Soltani A and Wang X-J (2004). "Exploring the Neural Basis of the Matching Law in Choice Behavior: A Cortical Network Model with Reward-gated Learning". *Society for Neuroscience*

TEACHING EXPERIENCE

Student advising: Division of Biology, California Institute of Technology (2007–2009)

- Fatma Imamoglu (graduate student)
- Nakul Reddy (graduate student)
- Ayon Sen (undergraduate student)
- Helene Schmidt (graduate student)

Teaching Assistant: Physics department, Brandeis University (2002–2003)

- Introductory Astronomy
- Quantum Physics (graduate level)
- Nonlinear Dynamics and Computational Neuroscience (graduate level)

Teaching Assistant: Physics department, Northeastern University (2001–2002)

- Statistical Mechanics (graduate level)
- Introductory Physics Lab and Interactive Learning Sessions

TEACHING COMPETENCIES

- Elementary, intermediate, and advanced Physics courses
- Theoretical and Computational Neuroscience
- Introductory, intermediate, and advanced Biophysics courses

HONORS AND AWARDS

- Computational and Systems Neuroscience Presenter's Travel Grant (2012)
- Howard Hughes Medical Institute Research Associate (2011-present)
- Caltech Division of Biology Postdoctoral Fellowship (2007–2009)
- Lawrence Award in Excellent Teaching, Northeastern University (2001)
- Ranked 9th in the National Physics Graduate Exam (among 4000 physics majors students), Iran (1998)
- Ranked 128th in the General Entrance Exam for universities (among 300,000 students), Iran (1994)
- Ranked top ten in the National Physics Olympiad exam, Iran (1993)

PROFESSIONAL ACTIVITIES

Reviewer for Journals

Cerebral Cortex

Journal of Neuroscience

PLoS Computational Biology

International Journal of Computer Mathematics

Neural Networks

Reviewer for Book Proposals

Academic Press

PRESENTATIONS

- Memory and Decision seminar talk, Stanford University, Stanford, CA, Apr 2012
- Albert Einstein College of Medicine, New York, NY, Mar 2012
- Computational and Systems Neuroscience, Salt Lake City, UT, Feb 2012
- Mind, Brain and Computation seminar talk, Stanford University, Stanford, CA, Jun 2011
- FMRIB Centre, University of Oxford, Oxford, UK, May 2011

- University College London, London, UK, May 2011
- Computational and Systems Neuroscience, Salt Lake City, UT, Feb 2010
- Caltech Biology Division Annual Retreat, Lake Arrowhead, CA, Oct 2008
- 15th Joint Symposium on Neural Computation, UCI, CA, May 2008
- CRCNS PI Meeting, University of Maryland, College Park, MD, Jun 2007
- Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, Mar 2007
- Princeton Neuroscience Institute, Princeton University, Princeton, NJ, Mar 2007
- Computational and Systems Neuroscience, Decision Making Workshop, The Canyons, UT, Feb 2007
- Human Neuroimaging Lab, Baylor College of Medicine, Houston, TX, Feb 2007
- School of Cognitive Sciences, IPM, Tehran, Dec 2006
- Society for Neuroscience Annual Meeting, Atlanta, GA, Oct 2006
- University of Rochester, Rochester, NY, Sep 2004
- Sloan-Swartz Centers for Theoretical Neurobiology Summer Meeting, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, Jul 2004

REFERENCES

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Statement of Research Interests

Alireza Soltani (asoltani@stanford.edu)

Value-based decision making and selective attention are among the most important human cognitive functions and have been well studied for several decades now. However, we still lack a coherent understanding of these cognitive functions because most of our knowledge about how the brain performs computations necessary for these functions comes from experimental data which are limited to a single level of investigation (i.e. molecular, cellular, or network) and cannot easily be related to each other. This is mainly because as in any complex system, functions of the brain are emergent properties of the interactions between neural elements at multiple levels and cannot be understood fully by investigating the brain at a certain level alone. To move forward, we need to study the brain as whole by integrating disparate experimental data into computational models that can explain both neural and behavioral data.

Having had the opportunity of collaborating with experimentalists who use a wide range of methods, such as monkey electrophysiology, behavioral economics, and human MEG and fMRI, I have experience in integrating behavioral and neural data for modeling brain functions at different levels of complexity. My research goals are to study the brain as an integrated system by constructing detailed biologically-realistic network models –using molecular, cellular, and behavioral data –in order to: (1) identify the role of individual brain areas and their interactions in value-based decision making and attention; (2) investigate biophysical mechanisms underlying the influence of neuromodulators on neuronal processes and their resulting effects on cognitive functions; (3) and explain cognitive disorders in terms of alterations in models' components at different levels (i.e. synaptic, cellular, and network).

Past and Current Research

My past research has been focused on computational and theoretical research on adaptive value-based decision making, selective attention, and neuroeconomics.

I started my research in computational neuroscience (under the supervision of Xiao-Jing Wang) by investigating neural mechanisms underlying the most innate value-dependent behavior, called foraging behavior. Years of experiments on foraging behavior have pointed to a global behavioral principle known as the "matching law," which states that animals allocate their time and responses in proportion to the reinforcement they receive from each choice option. This law describes the overall behavior but does not address how matching is achieved on a trial-by-trial basis, its limitations, or its underlying neural mechanisms. As my first project in computational neuroscience, I used available experimental data to investigate neural mechanisms underlying the matching law. By examining possible ways that dopamine can affect synaptic plasticity, I found a plausible reward-dependent learning rule that enables synapses to compute return (i.e. reward per selection of a choice). A decision-making network that receives inputs from such synapses can stochastically select the option with higher return on every trial and achieve matching behavior. The outcome model accounts for observed under-matching behavior in terms of biophysical constraints, and model neurons demonstrate graded activity similar to experimental observations [1]. Later, I utilized a similar approach to investigate stochastic choice behavior during a competitive game (in collaboration with Daeyeol Lee at Yale) in order to explain how random choice behavior is generated in spite of intrinsic biases, and what is the underlying mechanism for observed slow changes in animals' strategies over the course of the experiment [2].

In most natural cases, adaptive decision making entails learning and integration of information from various sources while the feedback is usually in a binary format (e.g. success or failure). This requires the brain to solve the nontrivial problem of assigning the correct weight to each piece of information. To explore how the brain solves this problem, I developed a neurally-plausible model capable of making inferences and combining information from different pieces of evidence. I showed that plastic synapses can acquire information about different cues through a simple reward-dependent learning mechanism [3]. Information stored in plastic synapses, in turn, modulates inputs to a decision circuit and so enables the model to perform inference and cue combination at the same time. This model provides a simple mechanism for inference and explains most of the behavioral data and correlated neural activity in the so-called weather prediction task, which is assumed to involve high-level cognitive abilities.

Most neural correlates of the decision processes described above were measured in the lateral intra-parietal (LIP) cortex, a sensorimotor area in the dorsal visual pathway which also has been shown to encode a saliency map of visual space. But, what exactly enables this area to contribute to both decision-making and attentional processes? To answer this question, I joined Christof Koch's lab at Caltech to explore the neural mechanisms underlying bottom-up attention and formation of saliency signals in higher visual areas, processes that rely on interactions between many visual areas. My approach was to construct a biologically-plausible spiking network, which consists of multiple visual areas, to capture electrophysiological recordings from these areas. I found that saliency signals are rapidly generated through lateral excitation and inhibition in successive layers of neural populations selective to a single feature (i.e. color or orientation), while slow NMDA currents dominate the excitation. Furthermore, the saliency signals can be improved by feedback from a higher cortical area, such as LIP or the frontal eye field (FEF), that instantiates a saliency map. These results demonstrated how interaction between multiple brain areas is crucial for guiding bottom-up attention, and indicated that cortical areas such as LIP and FEF are important in decision and attentional processes because they act as areas where sensory and reward-dependent inputs interact competitively to determine the next saccade location or focus of attention.

In order to further explore this interaction, I worked in collaboration with Tirin Moore at Stanford to investigate the influence of reward and FEF manipulation (via electrical microstimulation or drug infusion) on monkeys' target selection and attention. Using a model-based approach, I found that during a free-choice task not only are both selection and attention influenced by the integration of reward over many trials, but that this integration has different forms which enables us to dissociate the effects of reward on selection and attention [5]. This work helps to resolve an important issue in system neuroscience [6] and also reveals reward-dependent competition between endogenous and exogenous signals that control choice behavior and attention. Considering that reward signaling is mainly through dopamine, I then embarked on exploring the role of this neuromodulator in attention and choice behavior by constructing a computational model based on the experimental data from the infusion of dopamine receptor agonists and antagonists into the prefrontal cortex. Using this approach I have identified neural mechanisms through which dopamine differentially modulate selection and attentional processes [7].

Many high-level cognitive processes cannot be studied easily in non-human primates and so most neural correlates of these processes come from different imaging methods in humans (e.g. EEG, MEG or fMRI). However, due to low spatial resolution of these methods, identified neural correlates cannot be linked easily to any biophysical mechanisms, which therefore causes a disconnect between our knowledge of cognitive and neurobiological processes. This problem can be mitigated by investigating the imaging data guided by neuronal response which are obtained from relevant biologically-inspired models. In such an attempt (in collaboration with Tim Behrens at Oxford), we were able to disentangle MEG neural signals related to value comparison from other decision related signals throughout the brain [8]. I have also used a similar approach to explore neural mechanisms underlying the influence of context (i.e. context in which options are presented) on economic choice behavior. Specifically, in collaboration with Colin Camerer at Caltech, I designed an fMRI experiment to study the effects of context. I used the resulting experimental data to develop a model that explains most of the context effects in terms of changes in value representation due to limitation of neural representation [9].

Future Research Plans

A few decades of intensive research on neural mechanisms of value-based decision making and attention, and how they are affected by neuromodulators, has identified neural correlates of these two cognitive processes in many brain areas. However, due to similarities between the discovered neural correlates and multiple brain areas shared by these processes, the exact role of each brain area or certain neuromodulators has become more ambiguous [6]. Fortunately, experimental data from perturbed brain states –generated by optogenetic and electrical stimulations, manipulations of neuromodulators, or neuronal disorders –has created opportunities for computational investigations to clarify these ambiguities.

As the next step, using computational modeling powered by new experimental data, I will pursue the following research goals in the next few years:

1) I plan to expand current detailed models of value-based decision and attention to include interactions between multiple brain areas and capture observed neural data from these areas. Treating the brain as an integrated system is a crucial step for understanding these cognitive processes, as there are almost no attentional or decision computations that are performed by a single brain area. For example, in my own work I have shown that saliency computations require interaction between many visual areas [4]. Fortunately, in addition to ever-increasing computational power to simulate larger and more detailed model networks, a new neuromorphic technology which combines analog and digital computation, called Neurogrid, enables us to simulate up to one million neurons in real time [10]. Using Neurogrid and conventional computational methods, I plan to tackle these theoretical questions: how are certain decision and attentional computations performed by networks of neurons in multiple brain areas; and depending on their cellular properties and connectivity, what are the specific contributions of individual brain areas to these computations. This is not only crucial for better understanding of decision and attentional processes, but is also important for revealing true effects of the globally transmitted neuromodulators (e.g. dopamine) and for finding treatments for neurological disorders that affect multiple brain areas.

2) I plan to explore biophysical mechanisms underlying the influence of dopamine on value-based decision making and attention. Dopamine has an important role in synaptic plasticity and provides a substrate for reward signaling, and moreover, alterations of the dopaminergic system have been linked to drug addiction and attention deficit disorder hyperactivity (ADHD). This is an exciting time for computational research on the role of dopamine because on the one hand, infusion of different drugs that enhance or suppress dopamine is producing a wealth of data on the effects of neuromodulators on neural processing [11]. On the other hand, optogenetics provides a precise tool for manipulating neural circuits in intact animals [12]. As the next step I aim to interpret and incorporate findings from these two experimental approaches to build model neurons that capture dopamine-dependent synaptic plasticity and cellular changes, which in turn will be used in network models of decision and attentional processes. This effort will advance our knowledge of these processes and provide resources for research on finding treatments for neurological disorders such as ADHD, and for drug addiction.

My strategy is to look for the minimum set of components to construct a model that can explain existing experimental data related to a given cognitive phenomenon. The model should be simple enough to provide insights about underlying neural mechanisms but complex enough to offer nontrivial predictions to be tested by experimental collaborators. The findings from new experiments would, in turn, enable us to refine future models. I believe that such a cooperative interaction between theoreticians and experimentalists is the key to advancing our knowledge of neural processes.

Over the past few years, I have collaborated with experimentalists in different fields to explore questions related to various cognitive processes. Similarly, my research in the future would rely on collaborative work between my lab and existing labs at Brown University. Specifically, I envision working closely with faculty who perform research on attention and decision making, synaptic plasticity, and optogenetics. My goal is to foster a cooperative environment in my lab by encouraging students to understand experimental approaches and engage in research projects which involve close collaboration with experimentalists.

References

[1] Soltani A and Wang X-J (2006). “A Biophysically-based Neural Model of Matching Law Behavior: Melioration by Stochastic Synapses”. *Journal of Neuroscience*, 26(14): 3731–44.

[2] Soltani A, Lee D, and Wang X-J (2006). “Neural Mechanism for Stochastic Behavior During a Competitive Game”. *Neural Networks*, 19(8): 1075–90.

[3] Soltani A and Wang X-J (2010). “Synaptic Computation Underlying Probabilistic Inference”. *Nature Neuroscience*, 13(1): 112–9.

[4] Soltani A and Koch C (2010). “Visual Saliency Computations: Mechanisms, Constraints, and the Effect of Feedback”. *Journal of Neuroscience*, 30(38): 12831–43.

[5] Soltani A, Schafer RJ, Burrows BE, and Moore T. “Separable Influences of Reward on Prefrontal Control of Attention and Target Selection”. *Under revision in Nature Neuroscience*.

[6] Maunsell J (2004). “Neuronal Representations of Cognitive State: Reward or Attention?” *Trends in Cognitive Science*, 8, 261–5.

[7] Soltani A, Noudoost B, and Moore T. “Dissociable Dopaminergic Mechanisms Control Where to Look: Implications for Reward Modulation”. *Under review in PNAS*.

[8] Hunt LT, Kolling N, Soltani A, Woolrich MW, Rushworth MFS, and Behrens TEJ (2012). “Mechanisms Underlying Cortical Activity During Value-guided Choice”. *Nature Neuroscience*, 15(3): 470–476.

[9] Soltani A, De Martino B, and Camerer C (2012). “A Range-normalization Model of Context-dependent Choice: A New Model and Evidence”. *PLoS Computational Biology (accepted)*.

[10] Silver R, Boahen K, Grillner S, Kopell N, and Olsen KL (2007). “Neurotech for Neuroscience: Unifying Concepts, Organizing Principles, and Emerging Tools”. *Journal of Neuroscience* 27(44):11807–19.

[11] Robbins TW and Arnsten AF (2009). “The Neuropsychopharmacology of Fronto-executive Function: Monoaminergic Modulation”. *Annual Review Neuroscience* 2:267–87.

[12] Deisseroth K (2011) “Optogenetics”. *Nature Methods* 8(1):26–9

Statement of Teaching Philosophy

Alireza Soltani (asoltani@stanford.edu)

I come from an academic family that has shaped my passion for pursuing knowledge as much as it has instilled in me the enthusiasm for teaching others. Throughout my years of training in physics, I have learned that the tools and skills of how to think about scientific questions or inquiries are more important than learning about discrete topics in science. I have been an instructor for both undergraduate and graduate level classes in physics and computational neuroscience. In addition to my classroom experiences, mentoring junior graduate students and undergraduate research students in the lab and interactions with them in the day-to-day business of conducting research all shape my teaching philosophy. I am committed to and enjoy teaching and mentorship, both inside and outside the classroom, through an analytical approach to scientific inquiry that emphasizes the tools and processes of problem solving.

Classroom Teaching

My goal in teaching both introductory and advanced courses is twofold. First, I aim to cover a breadth of topics in my courses that prepare students for further study and research in science. Second, and more importantly, my goal is to engage students in the process of science and research. Specifically, I discuss the skills necessary to think about problems in science and give my students concrete material to test ideas. In some cases, I give them simplified experimental data (e.g. traces of neural response to different stimuli) and teach them how to ask relevant questions (e.g. what do these neurons represent?) and then guide them on how to go about analyzing the data to find answers for these questions. In other cases, I provide them with hands-on experiments (e.g. simple a decision-making task) which they can carry out in the classroom, and then teach them how to analyze the outcome and construct models to explain the results, etc. I present many topics through the questions posed by the scientists who were working on them. Accordingly, I incorporate simplified material from my own research as well as other original research, to highlight the scientific process underlying investigation of the topics of study in my courses.

Research Mentorship

As with my philosophy in the classroom, my emphasis in mentorship is on teaching students how to look for interesting research questions in light of existing literature, develop hypotheses for possible answers, and think about the multiple ways of testing these hypotheses and finding answers. I encourage students to narrow down potential solutions through articulating their research ideas and thought processes in a continuous discussion. Additionally at Brown University, I aim to carry my experience as a theoretician, who has benefited from collaboration with experimentalists, into my mentoring responsibilities. I plan to guide my students through reading experimental works and foster collaborative research projects in my lab.

Proposed Courses

I am able to teach undergraduate and graduate courses in Neuroscience already offered at Brown University, including:

- NEUR 1680 – Computational Neuroscience
- NEUR 1930 – Topics in Neuroscience
- NEUR 2010 – Graduate Proseminar in Neuroscience
- NEUR 2060 – Advanced Cognitive Neuroscience

Additionally I would be excited to teach the following courses I have developed in my area of specialty:

1. Advanced Computational Neuroscience – This graduate-level course introduces various theoretical and computational methods used for studying the brain and nervous system. Students will learn to simulate various neural processes, build computational models, and analyze data from their models.
2. Biophysics of Cognition – This graduate-level course focuses on neural substrates of cognitive processes. We cover many topics in learning, working memory, decision making, and attention. This course is designed to teach students how to simulate networks of neurons that can account for cognitive functions and phenomena.