Benjamin **Suutari**

Data Science · Neuroscience · Physics

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Experience

Neuroscience Institute — *New York University*

Graduate Research Assistant — *August 2011 - Present*

- Designed and implemented thesis project to understand interactions between groups of inhibitory neurons to promote information fidelity in the hippocampus
- Designed biophysically realistic computational simulations of neurons and microcircuits to explore parameter spaces of empirical data using Python, NEURON and Monte Carlo Simulations
- Created lab code base for easy collaboration and use of common analysis functions (github.com/TsienLab)
- Collaborated on two separate projects to study effects of mutations seen in autistic phenotypes on biophysical and molecular properties of neurons

Center for Neural Science — *New York University*

Teaching Assistant — *August 2012 - December 2015*

- Lectured on special topics in computational and systems neuroscience
- Lead recitations of course material on cellular biophysics, molecular neurobiology and neuronal microcircuit dynamics
- Tutored undergraduate students, graded exams and provided feedback on course material

Center for Complex Systems and Brain Sciences — *Florida Atlantic University*

Research Assistant — *July 2008 - August 2011*

- Designed and implemented Matlab code for signal processing of human EEG signals utilizing Fast Fourier Transform, Wavelet Analysis, PCA and beamforming
- Collaborated on designing visualization of high-density, processed EEG signals through 3d colorimetric-topographical map of electrode scalp position
- Lead behavioral-EEG experiments on human subjects to observe correlation of EEG signals between participants coordinating on a motor task
- Collaborated on Brain-Machine-Interface project for text input from EEG signals

Skills

Programming	Python, Matlab, R, C, SQL, LaTeX, Git
Machine Learning	Artificial Neural Networks, Monte Carlo, Maximum Likelihood
Computational Tools	Scipy, Numpy, Scikit-Learn, NLTK, wavelet analysis, Fast Fourier Transform, Biopython
Coursera	Machine Learning (Andrew Ng), Computing for Data Analysis (Roger Peng), Finding Hidden Messages in DNA (Pavel Pevzner), Genome Sequencing(Pavel Pevzner)
Business	NYU Consulting Club; Coursework: The Business of Science, Fundamentals of Technology Commercialization
Languages	English (Native), Japanese(Intermediate/Advanced), Spanish(Beginner)

Computational Projects (github.com/moejamin)

Markov Chain Monte Carlo Simulation for Estimation of Synaptic Parameters

Python, NEURON

- MCMC with a Python-NEURON interface to estimate the probability density of a set of synaptic parameters in a computational neuronal micorcircuit model conditioned on experimental data

Artificial Neural Network for Image Recognition

Python, Scipy Libraries

- Backpropagting artificial neural network for supervised learning and recognition of images of faces

TLDResearch

Python, NLTK, Scikit-Learn

- Summarization tool for parsing complex PDF documents into simple summaries

Teaching tool for cellular biophysics

Python, NEURON

- Hodgkin-Huxley based single neuron model with GUI interface so that students can easily modify biophysical parameters and observe changes in modelled neuronal dynamics

Biophysically realistic model of neuron with BK channel alternative splice variant

Python, NEURON

- Hodgkin-Huxley based single neuron model to explore changes in action potential dynamics due to modifications of calcium sensitivity in BK channels seen in autism

Education

New York University

New York, NY, USA

PhD. Neuroscience in the Laboratory of Dr. Richard W. Tsien (Expected Graduation: Spring 2017) *August 2011 - Present*

- MacCracken Fellowship

Tokushima University

Tokushima, JAPAN

Certificate: Japanese Language; Concentration in Physics *March 2006 - April 2007*

- Full Scholarship
- Undergraduate Research in Dark Matter Detection (Dr. Zenro Hioki's lab), Quantum Mechanics, Statistical Mechanics and Particle Physics (in Japanese), Intensive Japanese Language Courses

Florida Atlantic University

Boca Raton, FL, USA

B.S. Physics *August 2004 - August 2009*

- Florida Medallion Scholarship - Full tuition and stipend

Selected Publications/Conference Presentations

An intellectual disability-linked mutation impairs learning by preventing CaM translocation to the nucleus

Science

Cohen, S.*, Suutari, B.*, Tsien, R.W., Ma, H.

Submitted

*Contributed Equally

Disinhibitory control of CA1 signal propagation through 5HT3a+ interneurons

Regeneron Science to Medicine Forum

2016

- Electrophysiological and computational investigation of microcircuit with multiple types of interneurons in CA1 hippocampus

Disinhibitory control of CA1 signal propagation through 5HT3a+ interneurons

Society for Neuroscience

2015

- Electrophysiological investigation of interactions between distinct populations of inhibitory interneurons to promote information fidelity in the hippocampus

Behavioral and Brain Dynamics of Team Coordination Part I: Task Design

Foundations of Augmented Cognition - Directing the Future of Adaptive Systems

Tognoli, E., Kovacs, A.J., Suutari, B., Afergan, D., Coyne, J., Gibson, G., Stripling, R., Kelso, J.A.S. *2011*

A fresh look on mu rhythms

Society for Neuroscience

2010

- High density (60 channels per subject) human electroencephalographic recordings between pairs of subjects coordinating on a motor task were analyzed with fast fourier transforms and wavelet transforms in space and time to elucidate novel oscillatory activity

Total Treatment Time Verification for the Contura™ Multilumen Balloon

Brachytherapy

Ouhib, Z., Kyriacou, A., Suutari, B. *2010*

- Verification method for radiation treatment times in cancer patients generated from treatment planning systems