Benjamin Suutari , Ph.D.

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Experience

Neuroscience Institute
New York University

Research Assistant/Postdoctoral Fellow
August 2011 - Present

- Designed and implemented thesis project to understand interactions between groups of inhibitory neurons to promote signal fidelity in the hippocampus integrating theoretical models with empirical validation
- 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 autism phenotypes on biophysical and molecular properties of neurons using computational and experimental techniques

Center for Neural Science
New York University

Teaching Assistant
August 2012 - December 2015

- Lectured on special topics in computational and systems neuroscience
- Led 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
- Led behavioral-EEG experiments on human subjects to observe correlation of EEG signals between participants coordinating on a motor task

Department of Physics
Tokushima University

Research Assistant
January 2007 - April 2007

- Performed callibration and analysis of sodium iodide scintillators for detection of dark matter

Skills

Programming/Computing	Python, Matlab, SQL, R, C, LaTeX, Git, GNU/Linux, Microsoft Windows, Mac OS
Machine Learning	Deep learning, natural language processing, computer vision, regression, clustering, SVM, decision trees
Computational Tools	Tensorflow, Scipy, Numpy, Pandas, Scikit-Learn, NLTK, Gensim, OpenCV, Biopython, signal processing
Web	Django, Bootstrap
Business	NYU Consulting Club; Coursework: The Business of Science, Fundamentals of Technology Commercialization
Languages	English (Native), Japanese (Intermediate/Advanced), Spanish (Beginner)

Selected Computational Projects (github.com/bensuutari)

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 trained on experimental data

Convolutional Neural Network for Facial Recognition in Tensorflow

Python, Tensorflow, Numpy, Python Image Library

- CNN trained on Yale Face Database, achieved 90% accuracy on test set

Personalized Medicine: Redefining Cancer Treatment (Kaggle)

Python, NLTK, Gensim, Scikit-Learn

- Natural language processing on expert texts to classify genes related to cancer

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 model neuron dynamics

Biophysical simulation of splice variant in BK ion channels

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 associated with intellectual disability

Education

New York University

New York, NY, USA

Ph.D. Neuroscience in the Laboratory of Dr. Richard W. Tsien

August 2011 - October 2017

- 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); Courses: Quantum Mechanics, Statistical Mechanics and Particle Physics (all courses taught 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

Nature Communications

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

In Review

*Contributed Equally

Excitation-alternative splice coupling supports homeostatic regulation of neuronal excitability

Cell

Li, B., Suutari, B., Sun, S.D., Tsien, R.W.

In Preparation

Disinhibitory control of CA1 signal propagation through 5HT3a+ interneurons

Regeneron Science to Medicine Forum

Suutari, B., Salah, A., Cohen, S.M., Tsien, R.W.

2016

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

Suutari, B., Weisberg, S.A., Tognoli, E., Kelso, J.A.S.

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 identify 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