

Alejandro F. Bujan

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Current position

Postdoctoral Researcher

Redwood Center for Theoretical Neuroscience, UC Berkeley

Areas of specialization

Computational Neuroscience • Machine Learning • Data Analysis

Education

- | | |
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| 2015 | PhD Computational Neuroscience, Magna Cum Laude
Albert-Ludwigs-Universität Freiburg, Germany |
| 2009 | MSc Computer Science, with Merit
University of Birmingham, UK |
| 2007 | Licenciatura Biology
Universidad Complutense de Madrid, Spain |

Research Positions

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|--------------------|---|
| 2/2015-
present | Postdoctoral researcher
Redwood Center for theoretical Neuroscience, UC Berkeley, USA |
| 3/2010-
1/2015 | Graduate researcher
Bernstein Center Freiburg, Albert-Ludwigs-Universität Freiburg, Germany |
| 1/2013-
3/2013 | Visiting scholar
Blue Brain Project, EPFL, Switzerland |
| 1/2008-
9/2008 | Undergraduate researcher
Neural Circuits Laboratory, Cajal Institute-CSIC, Spain |

Grants, honors & awards

2010 Marie Curie EU fellowship (FACETS-ITN)

Publications & Conference Presentations

PUBLICATIONS

- 2016 **Alejandro F. Bujan**, Jesse Livezey¹, & Fritz Sommer. [On degeneracy control in overcomplete ICA](#). arXiv preprint arXiv:1606.03474
- 2015 **Alejandro F. Bujan**, Ad Aertsen, & Arvind Kumar. [Role of input correlations in shaping the variability and noise correlations of evoked activity in the neocortex](#). *J Neurosci* 35.22 (2015): 8611-8625.
- 2014 **Alejandro F. Bujan**, Gerald Hahn¹, Yves Frégnac, Ad Aertsen, & Arvind Kumar. [Communication through resonance in spiking neuronal networks](#). *PLoS Comput Biol* 10(8): e1003811.
- 2010 Premysl Jiruska, Jozsef Csicsvari, Andrew Powell, John Fox, Wei-Chih Chang, Martin Vreugdenhil, Xiaoli Li, Milan Palus, **Alejandro F. Bujan**, Richard Dearden, & John Jefferys (2010), [High-frequency network activity, global increase in neuronal activity and synchrony expansion precede epileptic seizures in vitro](#), *J Neurosci*, Vol. 30, No. 16., pp. 5690-5701

CONFERENCE ABSTRACTS

- 2016 Kristofer Bouchard, **Alejandro F. Bujan**, & Fritz Sommer (2016) Sparse components of sensorimotor ECoG signals are relevant for speech control, COSYNE, Salt Lake City, Utah
- 2013 **Alejandro F. Bujan**, Gerald Hahn, Yves Fregnac, Ad Aertsen, & Arvind Kumar (2013) [Propagation of synchronous activity through network resonance](#), *Bernstein Conference 2013*
- 2013 Gerald Hahn, **Alejandro F. Bujan**, Yves Fregnac, Ad Aertsen, & Arvind Kumar (2013) [Synfire chains and gamma oscillations: two complementary modes of information transmission in cortical networks](#), *BMC Neuroscience* 2013, 14(Suppl 1):P226
- 2012 Grace Lindsay, **Alejandro F. Bujan**, Ad Aertsen, & Arvind Kumar (2012) ['Within' versus 'between' correlations and their relation to the network structure](#), Neuroscience Meeting Planner, New Orleans, LA: Society for Neuroscience, 2012. Online.

2012

¹Shared first authorship

Alejandro F. Bujan, Arvind Kumar, & Ad Aertsen. (2012). [Stimulus driven correlation gain modulation in neuronal networks](#). *Front Comput Neurosci*. Bernstein Conference 2012

2012 Grace Lindsay, **Alejandro F. Bujan**, Ad Aertsen, & Arvind Kumar. (2012). Membrane potential statistics reveal detailed correlation structure. *Front Comput Neurosci*. Bernstein Conference 2012

2012 **Alejandro F. Bujan**, Arvind Kumar, & Ad Aertsen (2012) Structure of stimulus induced correlations in random networks with distance dependent connectivity, *COSYNE*, Salt Lake City, Utah

Invited talks

2014 Redwood Center for Computational Neuroscience. UC Berkeley. Host: Fritz Sommer [video](#)

2014 Center for Integrative Neuroscience. UC San Francisco. Host: Loren Frank

2014 Center for Neural Circuits and Behavior. Oxford University. Host: Tim Vogels

Teaching

2013 **Models of Neurons and Networks**
Synfire Chains and Pulse Packets
Scientific Programming with Python
Introduction to Scientific Plotting with Matplotlib
Simulation of Biological Neuronal Networks
Network Topology and Dynamics

2012 **Quantitative Methods**
Signal Processing, Digital Signals and Stochastic Processes
Simulation of Biological Neuronal Networks
Network Topology and Dynamics

2011 **Scientific Programming with Python**
Advanced Data Structures and Numpy Arrays
Analysis and Models in Neurophysiology
Neuronal Data Analysis

Training & Workshops

- 2012 Advanced scientific programming in python summer school, Kiel, Germany
Sensory coding and natural environment, IST Austria
Neural Coding in Sensory Systems, FENS-IBRO-Hertie Winter School, Obergurgl, Austria
FACETS-ITN Course: Bio-Electronic Interface, Bordeaux, France
FACETS-ITN Course: High-Performance Computing, Juelich, Germany
- 2011 FACETS-ITN Course: Neuromorphic Electronic Circuits, Heidelberg, Germany
FACETS-ITN Course: Mean field models, Lausanne, Switzerland
FACETS-ITN Course: Theoretical Neuroscience, Lausanne, Switzerland
FACETS-ITN Course: Intellectual Property, Barcelona, Spain

Other activities

- 2011 Organizer of the [1st iCoNeT PhD Conference: from coding strategies to emergent functional properties in recurrent networks](#)