



Fabrizio Londei

WORK EXPERIENCE

Teaching assistant

LUISS Libera Università Internazionale degli Studi Sociali "Guido Carli" [2021 – 2023]

Course: Mathematics 2

Faculty: Economics and Business

Main Topics: Calculus and Linear Algebra

IT Consultant

Key Partner [2019 – 2020]

Main activities: IT System Integration Developer and Consultant

Software and Programming languages: Java, JavaScript, TIBCO BusinessWorks

Project: Smart Metering 2G at Acea S.p.A.

EDUCATION AND TRAINING

PhD in Behavioural Neuroscience

Sapienza, University of Rome [2020 – Current]

L'ultimo rateo di borsa è stato percepito con la mensilità di gennaio 2024.

The last Doctoral Fellowship accrual was received with the January 2024 monthly payment. Thesis not yet defended.

Curriculum: Neurophysiology

Main Topics: Cell Assemblies, Data Mining, Graph Theory, Static and Dynamic Coding, Information Theory, Machine Learning

Certificate of Training on Animal Welfare and Laboratory Animal Science

Center for Research and Services for Preclinical Testing and Animal Welfare (SPBA) [2023]

Training course (D.M 5 agosto 2021) accredited by the Italian Ministry of Health 0024495-12/10/2022-DGSAF-MDS-P

School on Data Analysis with Python toolboxes for Electrophysiology and Ca-imaging

GDR NeuralNet and Center for Neuroscience Research in Lyon (CRNL) [2021]

Main Topics: Python course, Information theory and connectivity using "frites", data manipulation and spike train analysis with "neo + elephant", spike sorting with "spikeinterface/spyking-circus/tridesclous", pipeline for calcium imaging with "suite2p"

Master degree in Applied Mathematics

Sapienza, University of Rome

Final grade: 110/110 – Level in EQF: EQF level 7

Thesis: Tighter bounds for the mixing time of subgraph random walks

Topic of the Thesis: Sampling graphlets (connected induced sub-graphs) within an original graph using random walks (Markov chain Monte Carlo methods)

Results: New formal bounds on the mixing time of the Markov chain associated with the random walk

Bachelor degree in Mathematics

Sapienza, University of Rome

Final grade: 97/110 – Level in EQF: EQF level 6

Thesis: Application of Hidden Markov Models to neuronal states

Topic of the Thesis: Analysis of parallel spiking activity using Hidden Markov Models (HMM)

Results: Recognition of recurrent patterns of co-activation in groups of simultaneously recorded neurons using HMM and prediction of associated behavioral correlates

Classical Baccalaureate

Liceo Classico Luciano Manara

Final grade: 97/100

LANGUAGE SKILLS

Mother tongue(s): **Italian**

Other language(s):

French

English

LISTENING C1 READING B2 WRITING A2

LISTENING B2 READING C1 WRITING C1

SPOKEN PRODUCTION B2 SPOKEN INTERACTION C1 SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Matlab, Python, R, C, C++, Fortran, Mathematica, SQL, Java, JavaScript

PUBLICATIONS

Connecting the dots in the zona incerta: A study of neural assemblies and motifs of inter-area coordination in mice

Londei, F., Arena, G., Ferrucci, L., Russo, E., Ceccarelli, F., and Genovesio, A. (2024). *iScience* 27, 108761.

Disentangling the identity of the zona incerta: a review of the known connections and latest implications

Arena, G., **Londei, F.**, Ceccarelli, F., Ferrucci, L., Borra, E., and Genovesio, A. (2024). *Ageing Research Reviews* 93, 102140.

Static and dynamic coding in distinct cell types during associative learning in the prefrontal cortex

Ceccarelli, F., Ferrucci, L., **Londei, F.**, Ramawat, S., Brunamonti, E., and Genovesio, A. (2023). *Nature Communications* 14, 8325.

Depolarization Block in the Endocannabinoid System of the Hippocampus

Tirozzi, B., **Londei, F.**, and Gianani, S. (2020). *NeuroSci* 1, 85–97.

Hidden Markov Models Predict the Future Choice Better Than a PSTH-Based Method

Marcos, E., **Londei, F.**, and Genovesio, A. (2019). *Neural Computation* 31, 1874–1890.

CONFERENCE PRESENTATIONS

Reconfiguration of the network activity during the goal-action transformation in the primate frontal cortex studied at the cell assembly level

[2023]

Fabrizio Londei, Francesco Ceccarelli, Giulia Arena, Lorenzo Ferrucci, Aldo Genovesio.

Neuroscience (SfN), Washington D.C.

Large-scale investigation of cell assembly coordination and network motifs in the mouse brain

[2023]

Fabrizio Londei, Giulia Arena, Francesco Ceccarelli, Lorenzo Ferrucci, Aldo Genovesio.

20th National Congress of the Italian Society for Neuroscience (SINS), Torino

Insights from the Zona Incerta: inter-area coordination assessed through cell assembly detection

[2023]

Giulia Arena, **Fabrizio Londei**, Francesco Ceccarelli, Lorenzo Ferrucci, Aldo Genovesio.

SINS National Meeting of PhD Students in Neuroscience, Torino

Efficiency and robustness in three cortical areas: frontal pole cortex, dorsolateral prefrontal cortex and orbitofrontal cortex

[2023]

Davide Cipollini, **Fabrizio Londei**, Aldo Genovesio.

20th National Congress of the Italian Society for Neuroscience (SINS), Torino

Neural Correlates of Observational Learning in the Macaque Dorsal Premotor Cortex during a Human- Monkey Interactive Associative Task

[2023]

Francesco Ceccarelli, Lorenzo Ferrucci, Simon Nougaret, **Fabrizio Londei**, Giulia Arena, Lorenzo Ferrucci, Aldo Genovesio.

Neuroscience (SfN), Washington D.C.

Characterization of cell assemblies and their organization in the macaque prefrontal cortex

[2022]

Fabrizio Londei, Francesco Ceccarelli, Giulia Arena, Lorenzo Ferrucci, Fabio Di Bello, Aldo Genovesio.

SINS National Meeting of PhD Students in Neuroscience, Brescia

A cell assembly-based analysis of single-unit activity in the macaque prefrontal cortex

[2022]

Fabrizio Londei, Francesco Ceccarelli, Giulia Arena, Fabio Di Bello, Aldo Genovesio.

Workshop of the International School of Neurosciences «Sir John Eccles» on "Comparative neurobiology of higher cognitive functions", Erice

From anatomy to functional connectivity in the mouse brain assessed through assembly detection methods

[2022]

Giulia Arena, **Fabrizio Londei**, Francesco Ceccarelli, Aldo Genovesio.

Brayn Conference, Rome

Formation of cell assemblies in the prefrontal cortex of macaque monkeys during a distance and a temporal discrimination task

[2021]

Fabrizio Londei, Francesco Ceccarelli, Lorenzo Ferrucci, Surabhi Ramawat, Isabel Beatrice Marc, Eleonora Russo, Aldo Genovesio.

71st Congress of The Italian Society of Physiology (SIF).

Stable and Dynamic Response Population Coding in Prefrontal cortex

[2021]

Francesco Ceccarelli, **Fabrizio Londei**, Surabhi Ramawat, Isabel Beatrice Marc, Aldo Genovesio.

71st Congress of The Italian Society of Physiology (SIF).

Differences in task difficulty encoding during logical decision-making in prefrontal and premotor cortical activity from non-human primates

[2021]

Surabhi Ramawat, Isabel Beatrice Marc, Marta Andujar, Francesco Ceccarelli, **Fabrizio Londei**, Pierpaolo Pani, Aldo Genovesio, Stefano Ferraina, Emiliano Brunamonti.

71st Congress of The Italian Society of Physiology (SIF).

Failure of the race model accounting for inhibition in a stop signal selective task of upper and lower limb

[2021]

Isabel Beatrice Marc, Valerio Romano, Surabhi Ramawat, Marta Andujar, Lorenzo Fiori, **Fabrizio Londei**, Francesco Ceccarelli, Stefano Ferraina, Emiliano Brunamonti.

71st Congress of The Italian Society of Physiology (SIF).

27/03/2024



Fabrizio Londei