Túlio Fernandes de Almeida

tuliofalmeida@hotmail.com | Site | Linkedin | GitHub | Google Scholar | Research Gate

Education

Sorbonne University — Paris, FR
PhD in Neuroscience part of the i-Bio program — *Oct. 2022 – Actually*

Edmond and Lily Safra International Institute of Neurosciences — Macaíba, RN, BR
Master in Neuroengineering — *Aug. 2019 – Jul. 2021*

Pontifical Catholic University of Minas Gerais — Belo Horizonte, MG, BR
Bachelor of Physiotherapy — *Aug. 2014 – Jul. 2019*

Experience

PhD Student — Set. 2021 – Oct. 2022
Sorbonne University — *Paris, FR*

- PhD student in the team led by Dr. Girardeau and part of the i-Bio program, working with electrophysiological analysis and recordings of emotional memories. During the Pre-Doc worked with gene expression at Global regulation for bacterial adaptation group with Dr. Sclavi, and with calcium image at Development of the spinal cord organization lab with Dr. Mangin.

Technical Support — Set. 2021 – Oct. 2022
Edmond and Lily Safra International Institute of Neurosciences — *Macaíba, RN, BR*

- I did analysis of electrophysiological data using signal processing, brain connectivity and machine learning, techniques. Also, assisting in writing scientific articles.

Master Student — Aug. 2019 – Jul. 2021
Edmond and Lily Safra International Institute of Neurosciences — *Macaíba, RN, BR*

- During my master I worked with data analysis using Python, performing multi-modal data fusion, application of machine learning algorithms, video and neural data analysis.
- Experience in animal behavior, electrophysiological data analysis and surgery for electrode implantation.
- I also had the opportunity to participate in the writing and submission of funding proposals with the approval of two grants.

Member of Machine Learning Research Group — Mar. 2020 – Oct. 2022
Edmond and Lily Safra International Institute of Neurosciences — *Macaíba, RN, BR*

Study group for weekly discussion of machine learning and deep learning articles and techniques. During these discussions we developed a series of projects.

- We developed projects and implemented machine learning techniques (pose estimation, autoencoder, SVM, t-SNE, GAN and others). Developed jupyter/colab notebooks tutorials.

Projects

i-Bio Summer School — Aug. 2023 – Aug. 2023
Sorbonne University - i-Bio program — *Banyuls-sur-Mer, FR*
I worked as teaching assistant in the i-Bio Summer School: Advanced Computational Analysis for Behavioral and Neurophysiological Recordings", which took place in Banyuls-sur-Mer, August 6-12 2023. During that summer school, practicals were organized into two groups that worked on different datasets. I was part of the group that worked on electrophysiological recordings performed in the hippocampus and the amygdala while the animal performed a navigation task and during subsequent periods of sleep.

C.I.T.R.O.N.S May. 2023 – Aug. 2023

Sorbonne University - IBPS - DSCO lab *Paris, FR*

C.I.T.R.O.N.S (Calcium Imaging Treatment using ROis; Numpy & Scipy) is an pipeline that I developed in Python using the pyimagej and scijava libraries to enable the use of ImageJ functions through Python and treat the images. The pipeline has been used in current and old laboratory data.

Bacteria Jan. 2023 – May. 2023

Sorbonne University - IBPS - BIG Lab *Paris, FR*

I developed an pipeline to analyze image data using SuperSegger and Omnipose, a library to process this data, called Bacteria and also the 3D modeling designs to fix the plate with PDMS to the centrifuge and distribute the bacteria in all channels of the microfluidic device.

PyRat Aug. 2020 – Oct. 2022

Edmond and Lily Safra International Institute of Neurosciences *Macaíba, RN, BR*

We used DeepLabCut to correlate brain oscillations and behavior, evaluate the object recognition task, quantifying the time spent on objects, detachment speed, head orientation and path preferences. For this, Python in Rodent Analysis and Tracking (PyRat) was developed, a library to analyze tracking outputs.

JAMA/PyJama Aug. 2019 – Oct. 2022

Edmond and Lily Safra International Institute of Neurosciences *Macaíba, RN, BR*

JAMA is an open access device designed to perform motion analysis using inertial measurement units and microcontrollers. PyJama is a python library for analyzing human kinematics data from types of devices.

Brain connectivity in rats with epilepsy Sept. 2021 – Oct. 2022

Edmond and Lily Safra International Institute of Neurosciences *Macaíba, RN, BR*

This project aims to characterize the effects of pentylenetetrazole on brain connectivity (electrophysiology).

Technical Skills

Programming Languages: Python, MATLAB, C/C++, Pascal, Med State Notation, LaTeX
Developer Tools: GitHub, Google Colab, VS Code, Platform IO, Arduino, Jupyter, Anaconda
Libraries: pandas, NumPy, Matplotlib, Bokeh, FastAI, PyTorch, FastAI, TensorFlow, scikit-learn, flask
Equipaments: Intan, Plexon, Blackrock, Stereotaxic, Med associates behavioral setup

Publications

Almeida, T.F; Spinelli, B.G; Gonzalez, M.C; Lima, R.H; Rodrigues, A.C (2022). **PyRat: An open-source python library for quantifying animal behavior.** Frontiers in Neuroscience, 16. https://doi.org/10.3389/fnins.2022.779106 .

Almeida, T.F; Borges, L. H. B; Dantas, A.F.O.A (2022). **Development of an IoT Closed Loop FES Device for Human Machine Interface**. Sensors, v. 22, n. 9, p. 3551, 2022. doi.org/10.3390/s22093551.

de Almeida, T.F.; Morya, E.; Rodrigues, A.C.; de Azevedo Dantas, A.F.O. (2021) **Development of a Low-Cost Open-Source Measurement System for Joint Angle Estimation**. Sensors, 21, 6477. https://doi.org/10.3390/s21196477

Almeida TF, de Araújo AR (2020) **Factors that Influence Injuries Occurrence in Jiu-Jitsu Competitors**. Int J Sports Exerc Med 6:164. doi.org/10.23937/2469-5718/1510164

Fundings

Pre-Doc and PhD fellowship by Initiative for Biology (i-Bio) for interdisciplinary research in Biology

Master's scholarship by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior

Reviewer

The Journal of Open Source Software (JOSS)