LORENA GONÇALVES DE ALCÂNTARA E FREITAS KRIKLER

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EDUCATION

2020 (Present) **PhD Electrical Engineering – École Polytechnique Fédérale de Lausanne (EPFL), Switzerland**
Courses: Signal Processing for Brain Imaging; Adaptation and Learning; Open Science in Practice.
Thesis title: "Dynamics of Brain Function in Preterm-Born Young Adolescents".

2015 **MRes, MSc Neurosciences** - Neurasmus, Erasmus Mundus Joint Masters Degree

Year 1: MRes Neuroscience, **Vrije Universiteit Amsterdam, Netherlands** (Cum Laude).
Year 2: MSc Medical Neuroscience, **Humboldt University of Berlin, Germany.**

2011 **BSc Computer Science** - **Federal University of Uberlândia, Brazil**
Relevant courses: Machine Learning; Image Processing; Information Retrieval; Project Management.
Exchange following Year 1 of the Information Systems MSc at **ENSIMAG, Grenoble, France**.

HONOURS AND AWARDS

2017 **Swiss Society for Neuroscience Travel Fellowship**
Awarded for the presentation of my project at the OHBM 2017 conference in Vancouver, Canada.

2015 **Cum Laude, Vrije Universiteit Amsterdam, The Netherlands**
The highest honours awarded by Vrije Universiteit Amsterdam for a Masters Degree.

2013 – 2015 **Full Erasmus Mundus Scholarship**
Awarded to the 2% top applicants of the Neurasmus Joint Masters Program in my year.

RESEARCH EXPERIENCE

2016 – Present Jun **Doctoral Candidate – École Polytechnique Fédérale de Lausane and University of Geneva**
Developing advanced signal processing and machine learning techniques to study brain function dynamics in children, within an interdisciplinary collaboration; Teaching Image Processing I and II, and Signal Processing for Functional Brain Imaging at Masters level; Supervising MSc student projects.

Keywords: *Time series analysis, unsupervised machine learning, MATLAB.*

2015 – 2016 Aug – Jan **Research Assistant – Centre for Bio-Inspired Technology - Imperial College London**
Collected and analysed multimodal data from surgical patients at Hammersmith Hospital to automatically monitor awareness and anaesthetics delivery during surgery.

Keywords: *Multimodal time-series analysis, mutual information, ECG+EEG analysis, MATLAB.*

2014 – 2015 Dec – Jul **Intern, MSc Thesis – Neurotechnology Group, Computer Science Dpt., Technische Universität Berlin**
Developed an algorithm based on dimensionality reduction that rejects noise artefacts from EEG signals in real time, to improve Brain-Computer Interfaces for patients with locked-in syndrome.

Keywords: *LDA classification, supervised and unsupervised machine learning, EEG, MATLAB.*

2014 Jan – Jul **Intern, MSc project – Center for Neurogenomics and Cognition Research (CNCR) Amsterdam**
Developed and lead a research study and analysis to enable a neurofeedback-based Brain-Computer Interface for attentional control. Trained 100+ BSc students to carry out their own projects.

Keywords: *Spectral EEG analysis, artefact removal, neurofeedback, experiment design, MATLAB.*

PROFESSIONAL EXPERIENCE

2012 – 2013 **Software Deployment Analyst - DEVEX S/A (now Hexagon Mining), Belo Horizonte, Brazil**

Provided software consultancy for the automation and optimisation of production in high end mining firms. Managed projects and small teams (2–4 people). My final project increased our client's productivity by 20% in two months.

2010 – 2012 **Software Engineer (iOS) - Shockmonkey Studios, Uberlândia, Brazil**

Developed iOS applications in Objective-C using an agile methodology (SCRUM). The final app I helped develop reached the top 5 most downloaded for its category in the whole country. Supervised interns and helped manage project sprints.

EXTRACURRICULAR PROJECTS AND COURSES

- 2019 project: A machine learning-based age classification project using the NHANES open access medical dataset, in Python (main python libraries: Pandas; Numpy; Scikit-learn).

- 2019 project: A video manipulation tool to generate a static image of background scenes after removing transient objects such as passers by, in Python (main library: OpenCV).

- 2020 project: A multi-class image recognition project in Python, employing all steps of the data science lifecycle including data acquisition through web scraping; data scrubbing; multi-class classification using a deep convolutional network; and application of the results as part of a hackathon challenge (libraries: BeautifulSoup, Keras).

- 2020 course: Innosuisse Business Training Course – 48h of lectures from industrial experts on market analysis, financial planning, product development, presentation skills.

PROGRAMMING SKILLS

MATLAB (*advanced*), Python (Pandas; Numpy; Scikit-learn; Keras; OpenCV: *intermediate*), C, C# .NET, Java, PL/SQL (*previous experience*).

LANGUAGE SKILLS

Portuguese (*Native*); English (*Fluent*); French (*Advanced*); Italian (*Intermediate*); Spanish (*Intermediate*) Dutch (*Elementary*); German (*Elementary*).

LIST OF PUBLICATIONS

Freitas, L. G. A., Bolton, T. A. W., Krikler, B. E., Jochaut, D., Giraud, A. L., Hüppi, P. S., & Van De Ville, D. (2020). Time-resolved effective connectivity in task fMRI: Psychophysiological interactions of Co-Activation patterns. *NeuroImage*, 212.

Liverani, M. C.*, **Freitas, L. G. A.***, Siffredi, V., Mikneviciute, G., Martuzzi, R., Meskaldij, D., Borradori Tolsa,C., Ha-Vinh Leuchter, R., Schnider, A., Van De Ville, D., and Hüppi, P. S. (2020). Get real: Orbitofrontal cortex mediates the ability to sense reality in early adolescents. *Brain and Behavior*, 10 (4): e01552

Bolton TAW**, Freitas, L.G.A**., Jochaut D., Giraud A.L., Van De Ville D. Neural responses in autism during movie watching : Inter-individual response variability co-varies with symptomatology. *Neuroimage*. 2020 : 116571.

Adam-Darque, A., **Freitas, L.G.A.**, Grouiller, F., Sauser, J., Lazeyras, F., Van De Ville, D., Pollien, P., Garcia, C., Bergonzelli, G., Hüppi., P.S., Ha-Vihn Leuchter, R. (2020) Shedding Light on Excessive Crying in Babies. *Pediatric Research* (*in press*)

Viaña J.N.M, **Freitas L.**, Severo M.C., Gilbert F. (2016). Decoded Neurofeedback: Eligibility, Applicability, and Reliability Issues for Use in Schizophrenia and Major Depressive Disorder. *AJOB Neuroscience* 7 (2), 127-129