Luiz Barbosa

Signal Processing Engineer, Data Scientist

08/05/1982

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Social Network

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About Me

I am working for Hilab in the research and development team. Here I am developing algorithms for augmenting the quality of microscope images and segment blood cells and platelets. I also worked with artificial intelligence techniques for Banco do Brasil's computer vision room. I have a deep knowledge of machine learning and deep learning. I am passionate about signal processing, robotics, and mathematics. In my master's degree, I used AI techniques to classify the electrical signal of the forearm. Through that moving a virtual hand prosthesis. Now, I am studying the reconstruction of signals sampled at a sub-Nyquist frequency for amplification and compression of images and other signals.

Skills

- Machine Learning ●●●●●
  - Clustering, Classification, Dimensionality Reduction, Regression
- Deep Learning ●●●●●
  - LSTM, CNN, Reinforcement Learning
- Data Science ●●●●○
  - Pandas, Numpy, Skit-Learn, SciPy, JuliaDB
- Probability and Statistics ●●●●●
  - Stochastic Process, Random Variables, Entropy
- Computer Vision ●●●●●
  - openCV, DSP
- Tensorflow ●●●●●
- PyTorch ●●●●●

Working Experience

2020 – today **Computer Vision Engineer** — Hilab, Curitiba – PR
Created algorithms for image classification, anomaly detection, segmentation and super resolution in order to increase the reliability of laboratory tests.

2019 – 2020 **Data Scientist and Computer Vision Engineer** — Stefanini TI Solutions, Barsília – DF
As an outsourcing for Banco do Brasil, studied about signal analysis on the time and frequency domain, for video processing and the application of machine learning and deep learning algorithms in computer vision for security (face presentation attack), facial and fingerprint recognition, image segmentation and tracking.

2018 – 2020 **Researcher in Biomedical Engineering** — University of Brasília, Brasília – DF
Studied of the myoelectric signal for the creation of an algorithm for the classification of the electrical signal of the forearm muscles. Through these studies came the understanding for the formalization of an algorithm for the pre-processing of the myoelectric signal. This study led to the creation of a control algorithm for a virtual manual prosthesis in real time.

2016 – 2017 **Project Coordination** — Sotovia Arquitetos Associados, Brasília – DF
Support to the Project Coordination of the Alberto Alcolumbre International Airport - Macapá - AP still working as a facilitator of the teams and Coordinator of the Electronics and Telematics team.

Education

Postgraduate Training

2018 – 2020 **Master degree in Biomedical Engineering** — University of Brasília, Brasília – DF
Study of the myoelectric signal for the creation of an algorithm for the classification of the electrical signal of the forearm muscles. Through these studies came the understanding of the formalization of an algorithm for the pre-processing of the myoelectric signal. This study led to the creation of a control algorithm for a virtual manual prosthesis in real-time.

Master Theses — University of Brasília, Brasília – DF
Use of entropy and clustering for the classification of the myo-eletric signal in combination with the use of machine learning deep learning techniques.

Study

2000 – 2009 **Bachelor in Mechatronics Engineering** — University of Brasília, Brasília – DF
Bachelor degree of mechatronic engineer, with studies in electronics, robotics, programming, control, thermodynamics, resistance of materials.

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Programming

- Python
- C/C++
- C#
  - Unity 3D
- MATLAB
- Rust
- Julia
  - flux

Technologies

- Docker
- Kubernetes
- Kubeflow
- IBM Watson OpenScale

Languages

- English
- French
- Japanese
- German

Interests

- Signal Processing
- Computer vision
- Artificial intelligence
- Robotics

Publications

2020 **Entropy and Clustering Information Applied to sEMG Classification**
42nd Annual International Conferences of the IEEE Engineering in Medicine and Biology Society
EMBS

2019 **Image-Based Analisys of Human Tissue Regeneration During Therapy Based on Photobiostimulation and Natural Latex Biomembranes**
Latin American Conference on Biomedical Engineering
CLAIB

2018 **Simultaneous Myoelectric Pattern Recognition**
XXVI Congresso Brasileiro de Engenharia Biomédica
CBEB

2017 **Exosqueleto Robótico de 4GDL para la Rehabilitación de Miembro Superior**
IX Congreso Iberoamericano de Tecnologías de Apoyo a la Discapacidad
IBERDISCAP

Extra-Curricular Activities

Sport Outdoor climbing
Art Photography