MATHEUS HOFFMANN BRITO

Recreio dos Bandeirantes, Rio de Janeiro, Brazil

📞 +55 (21) 99718-7508 ✉ mmatheushb@hotmail.com 💼 matheus-hoffmann 🐙 matheus-hoffmann

Education

Pontifical Catholic University of Rio de Janeiro (PUC-Rio)   Feb. 2020 – Aug. 2022
Master of Science in Mechanical Engineering   *Rio de Janeiro, RJ*

Pontifical Catholic University of Rio de Janeiro (PUC-Rio)   Feb. 2014 – Dec. 2018
Bachelor of Science in Mechanical Engineering   *Rio de Janeiro, RJ*

Technical Skills

Programming Languages: Python, C++, C, Bash, SQL, MATLAB/Simulink.
Frameworks/Libraries: Scikit-learn, TensorFlow, Keras, Numpy, Pandas, Matplotlib, Seaborn, Plotly, SimpleITK.
Developer Tools: PyCharm, Visual Studio Code, Microsoft Visual Studio, Git, GitHub, GitLab.
Platforms: Windows, Linux.
Others skills: Software Documentation, Object-oriented Programming, Event-driven Programming, Multilingual communication (Portuguese, English and Spanish).
Certifications: Machine Learning Analyst (IGTI-Bootcamp, 2021), SQL (Softblue, 2022), Intro to SQL (Kaggle, 2021), Natural Language Processing (Kaggle, 2021), Data Cleaning (Kaggle, 2021), Data Visualization (Kaggle, 2021), Google Analytics for beginners (Google Analytics, 2021), Certificate DELE (Diplomas de Español como Lengua Extranjera) level B2, Microsoft Excel 2010 (PUC-Rio, 2014).

Professional Experience

CTIS — SONDA Group   Oct. 2021 – Present
Machine Learning Engineer   *Rio de Janeiro, RJ*

- Develop 3D convolutional neural network (3D CNN) architectures to perform medical image segmentation using TensorFlow and Keras's open-source libraries.
- Development of algorithms to guarantee the random and balanced division of the dataset composed of numerical and categorical parameters.
- Docker environment configuration to execute the developed algorithms.
- Planning and running simulations in a High-Performance Computing (HPC) environment.

Tecgraf   Mar. 2019 – Sep. 2021
Software Engineer   *Rio de Janeiro, RJ*

- Development of a predictive model using machine learning techniques from scarce data.
- Creation of a python library for data analysis with a web interface, using Git as a versioning tool.
- Development of web applications with Plotly Dash for data visualization and analysis.
- Development of pre and post-processing routines using Python and Shell scripts to manage and run batches of OpenFOAM simulations.
- Developed a middleware to connect the REFPROP API with a C++ GUI library.

Yield Control Soluções em Energia S/A   Mar. 2018 – Dec. 2018
Mechanical Engineer Intern   *Rio de Janeiro, RJ*

- Customization and optimization of the HVAC system, creating an operational profile that reduces costs and increases the system's performance.

Projects

Skl Test | *Python, Scikit-learn*   Jul. 2021

- Developed a python library to compare the performance obtained by models available in Scikit-learn to solve regression and classification problems. It is possible to evaluate the influence of successive resampling and optimize the hyperparameters through a K-fold cross-validation holdout.

Baja Competitions | *Python, Scikit-learn, Flask, Heroku*   Apr. 2022

- Exploratory analysis of the results of Baja SAE teams in National competitions and development of an API to provide the cloud service at Heroku.

Model of a shock absorber using RBF Neural Network | *MATLAB, RBF Neural Networks*   Dec. 2020

- Designed and performed tests on a nonlinear shock absorber to generate data for a system identification algorithm. The model was able to predict the forces of the shock absorber with an accuracy of 93%.

Publications

- BRITO, M. H., Predicting dry gas seals reliability with machine learning techniques developed from scarce data, Master Thesis, (Rio de Janeiro, Brazil), 2022.

- KASSAR, B. B. M.; MARQUES, R. G. C.; JUNIOR, H. B. B.; BRITO, M. H., Improving operational equipment reliability with CFD analysis: case study of dry gas seal, Rio Oil and Gas Expo and Conference, (Rio de Janeiro, Brazil), 2020.

Relevant Coursework

- Machine Learning
- Signal Processing
- System Identification
- Design of Experiments
- Control of Systems
- Numerical Optimization

Other Relevant Experience

Co-advise undergraduate students final projects   **Mar. 2019 – Jun. 2021**
Co-advisor   *Rio de Janeiro, RJ*

- Co-advised four final project studies on off-road vehicle's brake, powertrain and suspension components, using Ansys topology optimization toolkit.

Baja Rio competition volunteering   **Nov. 2018 – Aug. 2021**
Committee   *Rio de Janeiro, RJ*

- Creation of the mentoring project, whose objective was to guarantee the evolution of Baja teams in Rio de Janeiro.

Baja SAE Racing Team   **Mar. 2015 – Sep. 2018**
Project Manager   *PUC-Rio*

- Successfully led teams of 20 people during two complete cycles of building new off-road vehicles.
- The team improved from 49th to 14th place, the best position in a National Competition.