Bruno Machado Pacheco

Control and Automation Engineering Student

Highly-focused young researcher with a passion for challenges. Interested in deep learning and optimization. Looking forward to starting a PhD in 2024.

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EDUCATION

Systems and Automation, MSc
Federal University of Santa Catarina ⬈

08/2022 - Present   *9.05/10*

Research
- Graph neural networks for solution prediction of combinatorial optimization problems
- Applications to oil production optimization and nanosatellite task scheduling

Exchange Student, Systems and Automation, MSc
RWTH Aachen ⬈

04/2020 - 09/2020   *2.3 (German system)*

Control and Automation Engineering, BSc
Federal University of Santa Catarina ⬈

03/2016 - 07/2022   *8.73/10*

Highlights:
- Thesis: Physics-Informed Deep Equilibrium Models for Solving ODEs
- Specialization in systems optimization
- Honors courses in calculus, linear algebra and linear analysis

PROFESSIONAL EXPERIENCE

Student Researcher
Machine Learning & Applications Research Group - GAMA/UFSC ⬈

11/2020 - Present   *Florianópolis, Brazil*

Achievements/Tasks
- Trained state-of-the-art U-Net-based models for brain tumor segmentation and brain extraction (brain segmentation)
- Authored a journal article on deep-learning-based brain extraction methods in the tumor segmentation pipeline
- Authored a conference paper on pre-training for brain age deep learning models
- Currently working on post-hoc confidence estimation for selective prediction on image segmentation tasks

Student Assistant
Production Quality - Fraunhofer IPT ⬈

04/2019 - 09/2020   *Aachen, Germany*

Achievements/Tasks
- Implemented and automated a data preprocessing pipeline for a turbomachinery milling process (+250 GB per dataset)
- Developed and implemented an anomaly detector for time series data from an industry partner
- Co-authored a scientific publication on automatic machine learning application in the production environment

INTERESTS

Deep Learning · Python

Combinatorial Optimization

Learning with Guarantees

AI Safety and Regulation

PUBLICATIONS

"Automated machine learning for predictive quality in production" Procedia CIRP (2020) ⬈

"Towards fully automated deep-learning-based brain tumor segmentation: Is brain extraction still necessary?" Biomedical Signal Processing and Control (2022) ⬈

"Does pre-training on brain-related tasks results in better deep-learning-based brain age biomarkers?" BRACIS (2023) ⬈

"Deep-learning-based Early Fixing for Gas-lifted Oil Production Optimization: Supervised and Weakly-supervised Approaches" SBAI (2023) ⬈

"Graph Neural Networks for the Offline Nanosatellite Task Scheduling Problem" (Under Review) ⬈

LANGUAGES

Portuguese
Native

English
Advanced

KNOWLEDGES

Python
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PyTorch
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JAX
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SCIP
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