

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
- 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
PyTorch
JAX
SCIP