



CAIO LAGANÁ FERNANDES

Ph.D Physicist
Developer

caiolagana.com.br caiolagana@gmail.com
 +55 35 99754 9882 github.com/caiolagana
 São Paulo, Brazil linkedin.com/in/caiolagana

SUMMARY

Possess a Ph.D. in High Energy Nuclear Physics at the European Organization for Nuclear Research (CERN). Awarded the Best Doctorate Thesis Prize by the Brazilian Physical Society in 2020. Experienced in machine learning, software development and data analysis.

SKILLS

Portuguese (native)	Ability to understand complex systems and work out efficient solutions to intricate problems
English (fluent)	
Italian (fluent)	
French (functional)	
German (beginner)	

PROJECTS

C++	Hypernuclei Search at CERN This C++ project was written as part of my Ph.D program. The script was ran over thousands of terabytes of data at CERN's computing infrastructure. It searches for the Λnn and Λpn hypernuclei in high-energy Pb-Pb collisions at the Large Hadron Collider.	https://github.com/caiolagana/LnnTreeCreator
Visual C#, SQL	Hydroelectric Power Plant Simulator Project written in Visual C# simulating the full scope of a hydroelectric power plant for training operators. A depth-search recursive algorithm is responsible for the electricity power flow, while numerical solution to differential equations emulates the machines.	https://github.com/caiolagana/PowerPlantSimulator
Python, AngularJS	AI Analysis of Legal Documents I am the head of a project utilizing Artificial Intelligence to extract and analyze data from legal documents. Written in python's FastAPI, integrated with MongoDB and served in a Docker container at AWS. Integrates with an AngularJS front-end.	https://github.com/e-fluxus/ia
Python, TensorFlow	Deep Learning Neural Network This is my own implementation of Michael Nielsen's deep learning neural network. An implementation of the same model is performed with TensorFlow.	https://github.com/caiolagana/DeepLearningPython

FORMAL EDUCATION

2013 - 2017	Doctorate in Physics University of São Paulo (USP) with one-year exchange program at European Organization for Nuclear Research (CERN). <i>Title:</i> Evidence for the existence of the Λnn hypernucleus with the ALICE detector	USP/CERN
2010-2012	Master's in Physics State University of São Paulo (UNESP) <i>Title:</i> Femtoscopia de colisões próton-próton no detector CMS do Large Hadron Collider	UNESP
2006-2010	Bachelor's in Physics Scholarship from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)	USP

COMPLEMENTARY EDUCATION

2012	Excellence in Detectors and Instrumentation Technologies Fermi National Accelerator Laboratory, Illinois (US)	Fermilab
2012	Short Term Course in Laboratory Techniques Brookhaven National Laboratory, Upton (US)	BNL
2010	Short Term Course in Data Analysis Tools at CERN European Organization for Nuclear Research, Meyrin (Switzerland)	CERN

EXPERIENCE

2014	Assistant Professor <ul style="list-style-type: none">Working hours (weekly): 6hCourse: Laboratório de Física Moderna	IFUSP
2017 - 2019	Visual C# Developer <ul style="list-style-type: none">Working hours (weekly): 40h	AQS Tecnologia

2019	Scientific Journal Referee • Physical Science International Journal	USP
2020	Scientific Journal Referee • Caderno Brasileiro de Ensino de Física	USP
2021	Assistant Professor • Working hours (weekly): 6h • Course: Física III	POLI-USP
2022 - Current	Python Developer • Working hours (weekly): 40h	E-FLUXUS

AWARDS

2013	Best Panel Prize of the XXXVI Reunião de Trabalho sobre Física Nuclear no Brasil Master's Degree	SBF
2020	Best Doctorate Thesis Prize by the Brazilian Physical Society Doctorate Degree	SBF

PUBLICATIONS

2018	Production of deuterons, tritons, ^3He nuclei, and their antinuclei in pp collisions Phys. Rev. C 97 p.024615
2018	Production of ^4He and $^4\overline{\text{He}}$ in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV at the LHC Nucl. Phys. A 971 p.1-20
2017	Measurement of the mass difference between top quark and antiquark in pp collisions Phys. Lett. B 770 p.50-71
2016	$^3_{\Lambda}\text{H}$ and $^3_{\Lambda}\overline{\text{H}}$ production in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV Phys. Lett. B 754 p.360-372
2015	Precision measurement of the mass difference between light nuclei and anti-nuclei Nature Physics 11 p.811-814
2015	Two-pion femtoscopy in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV Phys. Rev. C 91 p.034906
2014	Spectroscopic version of the Aharonov-Bohm effect C. Laganá Fernandes, arXiv:1403.6700
2013	Decaimentos nucleares em uma câmara de nuvens C. Laganá Fernandes, Revista Brasileira de Ensino de Física 35 p.3314
2011	Estudo de raios cósmicos utilizando uma câmara de nuvens de baixo custo C. Laganá Fernandes, Revista Brasileira de Ensino de Física 33 p.3302